SELF-REGULATION AND QUALITY OF LIFE AFTER A HEART ATTACK: A CROSS-CULTURAL STUDY

Submitted for the degree of Doctor of Philosophy

by
Johana Nayoan,
MSc

Research Centre *for* Society & Health
Buckinghamshire New University
Brunel University

2010

Abstract

Objective. Coronary heart disease has been on the rise in poorer countries and decreasing in developed countries over the last twenty years. However, the cardiac-related health-related quality of life (HRQOL) in poorer countries has not been studied. This study aimed to compare HRQOL following heart attack in a developing country in the East with that of a developed country in the West. Using the self-regulation of health and illness behaviour, the relationships between illness beliefs, coping cognitions and HRQOL are studied.

Design. This study was a cross-sectional correlational survey and data were collected shortly before myocardial infarction patients were discharged from hospital.

Methods. A sample of 243 individuals from the UK and Indonesia were recruited. Illness beliefs were assessed with the B-IPQ, along with coping cognitions (Brief-COPE) and health-related quality of life (MacNew questionnaire).

Results. Illness beliefs and coping cognitions predicted HRQOL in the combined sample. Some aspects of socio-demographic and clinical variables were concurrently associated with HRQOL.

Conclusion.
The results demonstrate that people in the East have low illness beliefs and these are associated with worse HRQOL compared with those in the West. The findings suggest that there is an urgent need for smoking cessation campaigns in the East, while the West could benefit more from tailored-cardiac rehabilitation programme emphasising exercise in the older groups.

(Word count: 209)

ACKNOWLEDGEMENT

I must begin with Dr. David Shaw, my doctoral supervisor, who had read this thesis countless times over the past years. I would like to also thank Dr. Nadia Wager for her significant contributions towards the end of my thesis, to Prof David Brodie and Dr. Nasim Kanji for their guidance and advice.

This thesis would also be incomplete without participants in these studies, for their willingness to talk to a stranger while they are not well. Spending time with these kindhearted people, in most of the time, raised doubts to whether their hearts are really not well. I also must thank the staff in hospitals in Jakarta, Mumbai and England for their help with data collection.

I would also like to thank the library staff at High Wycombe, Uxbridge and Chalfont libraries, where I do my work and my study. The library staff are the heart of the campus. I would also like to thank my colleagues at the Research Centre *for* Society & Health, particularly those who shared Room 0.21 with me: Dr. Jakovlevic, Yiming, Gay, Glen and Nonsi. They were my great companions in sailing the sometimes lonely and dark seas. Warm thanks also for my housemates who always took care me, Jeeva, Shanthi and Piyush.

Finally, a big hug for my parents, family in Jakarta and my friends everywhere, who had given me a tremendous support throughout the years being so far from home. And to Kanda who has waited forever for me. Thank you for always picking me up whenever I stumbled and who never had the slightest doubt I would be able to reach this far. I cannot imagine life without you.

It is my great hope that the findings in this thesis will make significant contributions to a greater understanding of having a heart attack, particularly in developing countries, where access to healthcare is limited. It is my wish to look back in ten years time to find there are no more inequalities in health.

This thesis is dedicated for my Dad for never losing his faith in me.

And also for my beloved grandmother who departed before the completion of this thesis.
You were my inspiration.

TABLE OF CONTENTS

APPENDICES

PART ONE: INTRODUCTION

This thesis is divided into five parts: Introduction, Theoretical Background, Psychometric Properties of the Questionnaires, The Cross-Cultural Study, and finally, Conclusion. This thesis starts with an introduction on the layout of this thesis. The following is Chapter One.

CHAPTER 1 INTRODUCTION

1.1 Context of this thesis

This thesis focuses on the role of self-regulation in people who have suffered a heart attack and their health-related quality of life (HRQOL) in two different cultures. Myocardial infarction (MI), the medical term for a heart attack, is one of the consequences of Coronary Heart Disease (CHD). Throughout this thesis, the term heart attack will be used, with the exclusion of Chapter Two where the term MI is more suitable.

This study explores two broad cultures: the UK, a country of Western values and Indonesia, a country of Eastern values. In the UK, there are also minority ethnic groups which are studied. The minority ethnic groups in focus are British South-Asian people, which include British-Indian, British-Pakistani, British-Bangladeshi and British Sri-Lankan groups. In this thesis the term ethnicity is used to refer to these minority ethnic groups according to the different countries from which they originate, but this usage should be treated with caution since it can lead to over-generalisation (Nazroo, 1997).

This thesis uses the self-regulation of health and illness behaviour as the basis of the study. In this model, self-regulation is the underlying foundation of behaviour and striving towards goals. The model explains the way individuals reach their goals, that is, through the parallel processing of problem-focused and emotion-focused goals, using both cognitive and behavioural processes to control the objective health problem and regulate emotional distress (Cameron & Leventhal, 2003). This model is particularly important in health settings where the goal is involuntary. Individuals with an illness would ultimately aim to be healthier, and hence the regulating behaviour is not entirely volitional (De Ridder & De Wit,

2006). This thesis explores the functioning of this model after a specific illness, heart attack.

Self-regulation is influenced by culture in that emotional and cognitive representations associated with illness are influenced by cultural values and belief systems. They can change illness experiences, coping responses, and other aspects of illness self-regulation. Therefore, the Eastern or Western cultures in which individuals are raised, contribute to how they strive to reach health goals.

The goal in a health context may also be influenced by culture and therefore it is important to measure a common goal. For example, following a doctor's advice is salient to a culture which puts a strong emphasis on conformity, or in an industrialised culture, returning to work is the most important goal. In this thesis, the health goal is translated into HRQOL with different aspects including physical, emotional, and social functioning, following a heart attack.

The above explanations provide the context for an investigation into the cross-cultural differences in self-regulation following a heart attack.

1.2 Aims of this thesis

This thesis emphasises the cross-cultural element of self-regulating of health and illness behaviour. The research reported here measures the functioning of self-regulation in health and illness behaviour in Eastern and Western cultures, represented by people who have had a heart attack living in Jakarta, Indonesia and in the West of London. There was also an opportunity to expand the study to another Eastern culture in Mumbai, India. However, due to factors beyond the control of the researcher, the Mumbai study produced insufficient participants for analytic purposes. Therefore, there is no specific chapter dedicated to this study.

However, occasionally, insights gained in Mumbai are referred to as they relate to the British-Indian community in particular, and to Eastern culture in general.

The aim of this thesis is to investigate whether there are differences between Eastern and Western cultures in shaping individuals' beliefs and how any such differences affect how people cope with stress in reaching health goals. This is examined in each individual country, followed by a between countries comparison. In the UK study differences between different ethnic minorities are also explored.

1.3 Contribution of this thesis

There are several ways in which this thesis contributes to the body of knowledge. First, the main contribution of this thesis is to the understanding of self-regulation in health and illness behaviour following a heart attack, in different cultures. The thesis has implications for the planning of cardiac rehabilitation programmes. The results of the study on British minority ethnic groups provide recommendations for interventions based on the modification of perceptions about a heart attack. Finally, this thesis contributes to the understanding of CHD and health psychology in Indonesia, where there is a lack of research in this area.

1.4 Layout of this thesis

This basis of this thesis is a substantial literature review followed by a study in two countries in Eastern and Western cultures. Diagram 1.1 explains the role of each individual chapter. The emphasis in this thesis is the cross-cultural element of the self-regulation of health and illness behaviour.

This thesis is divided into four parts with eleven chapters in total. What follows is a brief explanation of each chapter. Part Two consists of the literature review in five chapters: Chapter Two provides the bio-medical perspective of CHD, including its consequences, and reports on different risk factors associated with the development of CHD; Chapter Three reviews the cultural background that shapes health behaviour; Chapter Four evaluates the self-regulation in health and illness behaviour as the psychological model for this thesis, including illness beliefs and coping with CHD; Chapter Five focuses on HRQOL as the outcome measure of this thesis; and Chapter Six describes the general methodology employed in the studies contained in Part Four.

Part Three consists of two chapters that discuss the psychometric properties of the measurements utilised in both countries: Chapter Seven analyses the psychometric properties of the measurements in the UK sample, including details of the methods used and separate analysis of two ethnic groups: the British-Whites and British-Indian/Pakistani groups and Chapter Eight follows the same pattern of analysis for the Indonesian sample.

After this analysis, Part Four sets out the empirical sections of the thesis: the actual studies within these two countries as well as across the sample, which includes the following chapters: Chapter Nine analyses the self-regulation theory in health and illness behaviour and heart-disease HRQOL in the UK, Chapter Ten analyses the parallel study in Indonesia. The heart of this thesis lies in Chapter Eleven, with analysis of the combined samples, which serves as the cross-cultural study. This Chapter provides general discussion generated from the combined sample as well as the single-country chapters.

Finally, Part Five consists of the final chapter: Chapter Twelve is the conclusion chapter. It discusses the strengths and limitations of this study, contributions to

the body of knowledge and makes recommendations for cardiac rehabilitation practice, public health policies and future studies and for practice.

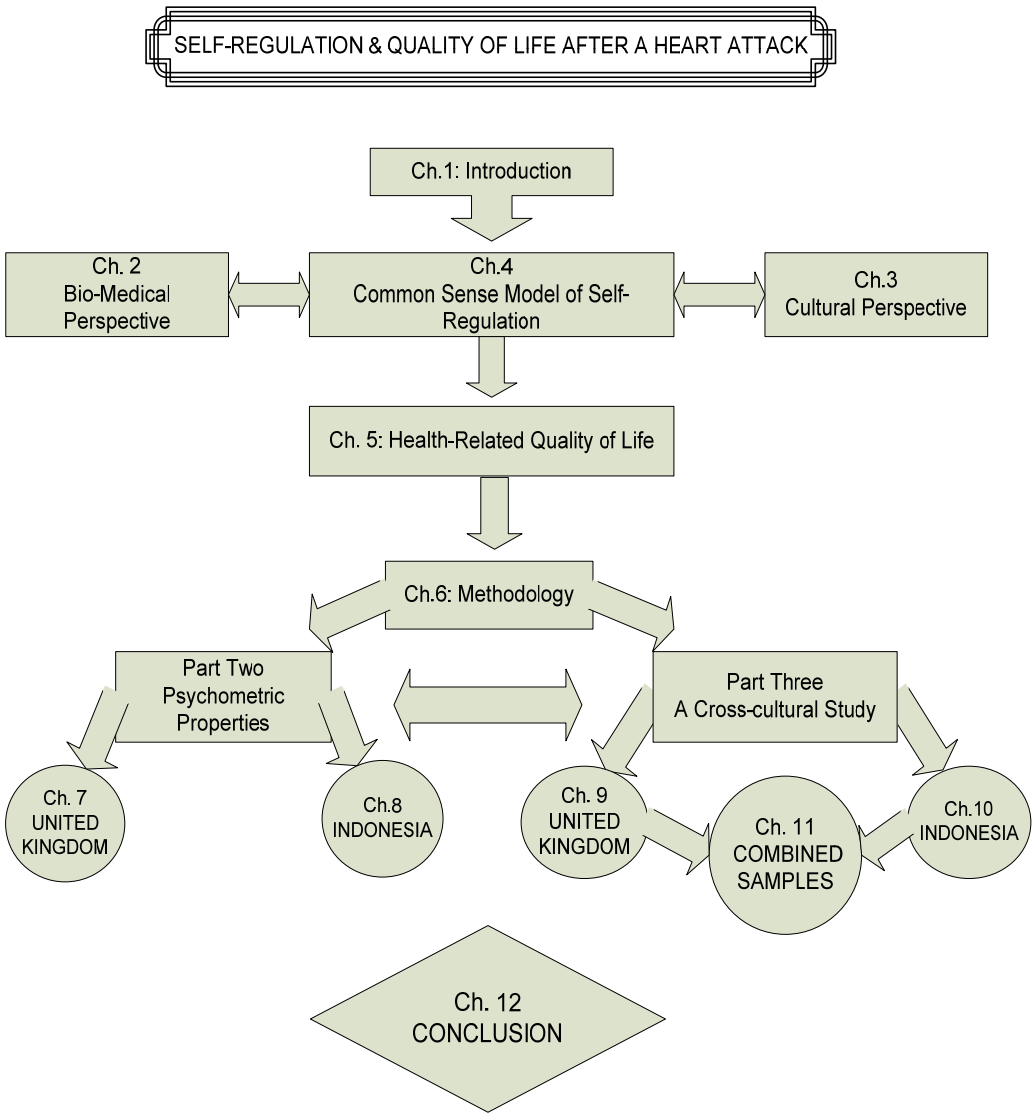

Diagram 1.1

Summary of the layout of this thesis

In the next five chapters of Part Two, the theoretical background and previous findings from studies into aspects of the CHD experience based on the literature is explained.

PART TWO: THEORETICAL BACKGROUND

There has been a great deal of interest in the study of CHD over the past three decades, not only on biomedical aspects, but also cultural and psychological perspectives.

This part contains five chapters reviewing biomedical, cultural and psychological aspects of CHD, followed by explanations about heart disease HRQOL and the general methodology of the main study. Chapter Two, explains the biomedical aspects in order to establish an understanding of this chronic illness. Chapter Three explains how culture shapes our thoughts and behaviour in relation to CHD. Chapter Four presents the self-regulation in health and illness behaviour, which provides the theoretical underpinning for this study. Chapter Five explains HRQOL and Chapter Six sets out the general methodology of the main study.

CHAPTER 2 CORONARY HEART DISEASE: THE BIOMEDICAL PERSPECTIVE

"Now I know I've got a heart... 'Cause it's breakin."

From Hickory the 'Tin Man' in The Wizard of Oz (1939)

2.1 Introduction

Mackay and Mensah (2004) in the Atlas of Heart Disease and Stroke, published by the World Health Organisation, suggest that heart disease is the most common cause of premature death worldwide. The report estimates that 7.2 million global deaths in the year 2002 alone were the result of CHD. Coronary Heart Disease is the most common type of cardiovascular disease and its outcomes range from death, to disability and reduced HRQOL.

Specifically, CHD is the main cause of premature death in the UK. It is responsible for 275,000 heart attacks and more than 110,000 deaths every year (Allender, Peto, Scarborough, Kaur, & Rayner, 2008). About one in five men and one in six women die from CHD (Allender *et al*., 2008). Mortality from CHD in the age group between 55 and 64 years of age has decreased by 47 percent since the late 1970s but this decrease has been at a slower rate in the younger age groups. The decreasing trends in mortality are probably due the advancement of medical and surgical treatments (Allender *et al*., 2008). However, compared with neighbouring developed European countries included in this study, deaths from CHD in the UK are relatively high.

Not only does it cost human lives, CHD also costs the nation financially. In the UK, CHD is estimated according to the BHF 2006 survey (Allender *et al*., 2008),

to cost over £3.6 billion which has more than halved compared with £7.9 in the BHF 2002 survey (Allender *et al*., 2008). This represents a cost per capita of just under £50 (Allender *et al*., 2008), compared with £133 in the previous survey (Petersen *et al*., 2004). Hospital care accounted for 73 percent of these costs (Allender *et al*., 2008).

Non-health care costs are also high. In the BHF 2006 survey, informal care of people with CHD was £1.8 billion (Allender *et al*., 2008). Furthermore, there was a £8.2 billion production loss due to CHD mortality and morbidity in the UK.

The following sections explain the nature of CHD, the factors that contribute to its development, the consequences that are likely to occur, and the treatment.

2.2 The pathology of coronary heart disease

There are several causes of CHD. CHD is one manifestation of a systemic condition, and is most commonly caused by blockage in the coronary arteries. This blockage is the result of widespread atheromatous plaque deposition. Over the years, plaque deposits reduce the room for blood to flow, thus depriving the heart muscle (myocardium) of nutrients and oxygen. Another mechanism by which CHD can develop is through coronary artery spasm, where the arteries contract. Thrombosis, a clot in an artery, can also be the source of the problem. The blockage involves a long process that develops over many years. Finally, CHD may be caused by a combination of two or more mechanisms mentioned above. The combination of any mechanism with another is more likely to be fatal.

2.3 Consequences of coronary heart disease

CHD can result in angina pectoris, MI, as well as impaired HRQOL or sudden death.

2.3.1 *Angina pectoris*

Angina pectoris occurs when there is insufficient blood flow causing a reduced supply of oxygen to the heart muscle in relation to its needs at a given time, which is called ischaemia. Ischaemia results in discomfort in the chest called angina (Julian & Cowan, 2005). Further, Julian and Cowan explain that the symptom is frequently a feeling of pressure, a tight band, or a heavy weight. On many occasions, the term 'sharp' is used to describe intense pain, as well as 'burning'. If it occurs in the neck, it sometimes described as 'choking', or 'like toothache' if it is in the lower jaw. Breathlessness is usually present. The feeling in the arms is of numbness, heaviness, or tingling. Each attack may last between one and three minutes, with 15 to 30 minutes in between attacks (Julian & Cowan, 2005). Symptoms are relieved within two to ten minutes by rest (Timmis, Nathan, & Sullivan, 1997). Angina pectoris is usually provoked by exertion when walking, particularly uphill. Provoking factors may include heavy meals, cold weather, or emotion. Anger and irritation are important emotional factors (Julian & Cowan, 2005). There are three syndromes of angina: (1) chronic stable angina, (2) variant angina, and (3) unstable angina.

The first syndrome, stable angina, is predictable. It is induced by effort and relieved by rest and does not increase in frequency or severity (Swanton, 2003). Timmis *et al*. (1997) explain that it is usually provoked by exertion and relieved after a resting period of two to ten minutes. It can include other provoking factors such as emotion and sexual intercourse, and symptoms are most likely to take place in the morning after getting up. This might be due to the fact that at this

time blood pressure is at its peak, which is also the reason symptoms are usually worse after a heavy meal and in cold weather (Timmis *et al*., 1997).

The second syndrome, variant angina, usually happens at night, unpredictably at rest and is unrelated to exertion, and it is due to an increase in tone in a localised segment of the coronary arterial wall (Lowe *et al*., 1993). Spasm is sometimes present. Prolonged spasm may result in MI (Timmis *et al*., 1997).

Finally, unstable angina is a type of angina that has recently developed, or pre-existing angina that has worsened rapidly without any apparent reason (Julian & Cowan, 2005; Lowe *et al*., 1993). It is usually a sign of serious underlying CHD (Garbett, 1998). Unstable angina occurs progressively at rest or during minimal exertion and is more similar in presentation to MI than to chronic stable angina (Lowe *et al*., 1993). The term 'unstable' is used because it increases in frequency and severity, often occurs with less exertion, and sometimes during resting and even when sleeping (Walsh, 2003). The mechanism involved includes rupture of atheromatous plaque, with or without superimposed thrombosis, and coronary spasm (Julian & Cowan, 2005). Unstable angina is a medical emergency. Up to 30% of cases progress to MI (Timmis *et al*., 1997). Angina pectoris may persist over time, or it can progress to MI.

2.3.2 *Myocardial infarction*

MI, widely known as a heart attack, is a common consequence of CHD. In the pathological diagnosis of MI, the evidence of myocyte cell death as a consequence of prolonged ischaemia is present (Antman & Braunwald, 2008a). Myocardial contraction is related to coronary flow and oxygen delivery, therefore the balance between oxygen supply and demand is a critical determinant of the normal beat to beat function of the heart. Disruption to this relationship is caused by disease affecting coronary blood flow, and the imbalance can precipitate a vicious cycle

(Canty, 2008). Tissue damage is the combination of (1) ischaemia, where tissue is damaged as a result of lack of oxygen but potentially recovers if oxygen is provided, (2) injury, where the tissue is more jeopardised but the damage is still potentially reversible, and (3) infarction, which is the worst as the damage is irreversible (Garbett, 1998).

The symptoms are usually described as tight, pressing, heavy, or discomforting in the centre of the chest. Although it only lasts for half an hour in most cases, it may last up to several hours. The pain is worse at the onset, but the intensity may persist for several minutes or several hours, and remains constant before it gradually recedes. Unlike angina, it does not diminish following resting. There is usually a history of pre-existing angina days or weeks prior to the onset of MI (Julian & Cowan, 2005). In about 20 to 30 percent of cases, an MI is 'silent' and does not include pain (Lowe *et al*., 1993). When severe coronary atherosclerosis is present, this appears to be sensitive to physiological and psychological stressors and this atherosclerosis may appear without the person realising it (Sapolsky, 2004).

2.3.3 *Cardiac failure*

In a small number of cases of ischaemic heart disease, the initial manifestation is cardiac failure. Cardiac failure is: ".. a syndrome in which a cardiac disorder prevents the delivery of sufficient output to meet the perfusion requirements of metabolising tissues." (Timmis *et al*., 1997, p.72). This takes place when there is a problem with the structure or function of the heart. This problem leads to insufficient blood flow regulation to the rest of the body. The failure can either be left-sided, right-sided or both-sided (Julian & Cowan, 2005). It is estimated that about two percent of adults in the developing world suffer from cardiac failure. This increases to up to ten percent for those above 65 years of age (Mackay & Mensah, 2004).

2.3.4 *Sudden coronary death*

Death may happen in cases of coronary atherosclerosis. In about half of these cases, there is usually a history of angina pectoris or a previous MI. Death occurs without any warning (Julian & Cowan, 2005). The cause is unknown, but it may be related to environmental and genetic factors.

Therefore, the treatment for MI is aimed at the dual purpose of improving survival and limiting morbidity. This is despite the potential discomforts and high risk of complications involved in short term invasive high-risk interventions, such as thrombolytic therapy and coronary angioplasty (Wenger, Naughton, & Furberg, 1996).

2.4 Treatment of coronary heart disease

The objective for treatment of patients with MI is the restoration of blood flow to ischaemic myocardium (Lane & Holmes, 2008). The time immediately following the onset of chest pain is one of maximum danger. Early diagnosis of MI is crucial as two-thirds of all heart disease cases who die in fewer than 28 days, die before reaching hospital (Mackay & Mensah, 2004).

Timmis *et al*. (1997) further explain that MI is a dynamic process. After blood flow partially or completely stops, the membrane that lines the heart dies due to loss of this blood supply. This happens within 30 minutes, yet it may take several hours for outward extension to involve the full thickness of the ventricular wall. This highlights the importance of early recognition of the warning signs, as well as the importance early treatment during this 'window of opportunity' to restore antegrade flow in the infarct-related artery. This has become the primary goal of hospital treatment as it allows reperfusion and salvage of the threatened myocardium with reduction of eventual infarct size. There are three methods of

achieving this: (1) thrombolytic therapy, (2) Primary Coronary Intervention (PCI), and (3) Coronary Artery Bypass Graft (CABG).

Thrombolytic therapy needs to take place immediately following infarct. About a third of patients with MI who are eligible do not receive thrombolytic therapy (Lane and Holmes, 2008). In the first instance, where emergency treatment is available, medical staff will monitor and manage any potentially fatal rhythm disturbances. The first action is to reduce the pain or discomfort and to give oxygen. Timmis *et al*. (1997) explain that in about 15 percent of MI cases, thrombosis and coronary recanalisation may take place spontaneously. Thrombolytic therapy increases the recanalisation rate. They further explain that when provided within one hour of the onset of chest pain, treatment can reduce mortality by up to 50 percent, which is why it is termed 'the golden hour' (Garbett, 1998). If treated within 12 hours, there is a diminishing benefit in terms of reduced mortality and morbidity. Most people with MI do not present within the golden hour, and not all will be suitable for this therapy. In some cases, aspirin is used as an anti-clotting agent in the thrombolytic treatment in the next stage which reduces the mortality chance.

In PCI or angioplasty, restoring coronary patency will be conducted early after the onset of symptoms. PCI seems to show a better result than thrombolytic therapy, in terms of mortality and recurrent infarction. However, not every hospital can undertake this procedure. Lowe *et al*. (1993) explain that the procedure involves a fine guide wire which is passed through a coronary catheter and to the artery past the narrowing. A balloon catheter is passed over the guide wire and inflated squashing the atheroma, stretching the artery and relieving the obstruction. Then, a stent, a small tube that is left in place to keep the blocked area widened, is inserted. When reduction is successful, it will relieve angina. They also explain that recurrence of symptoms could take place after six months in which case there will be a need for a repeat procedure. This can also be used instead of surgery in

non-emergency situations. Angioplasty has become more popular in the past 15 years. Anti-platelet medicines are usually prescribed to prevent clotting within stents (Hall, 2004). Each year, about 45,000 procedures are conducted in the UK. This initial treatment phase is crucial for survival and in minimising myocardial damage. Therefore, delaying treatment following the onset of pain can be very damaging.

Finally, CABG is another intervention, which has become less popular over time. To bypass the partly-blocked vessel, a section of blood vessel from elsewhere in the body is grafted onto the outside of the heart, connected to the coronary artery above the blocked section and rejoined below it, thus bypassing the blocked area (Hall, 2004).

People going through CABG surgery undergo a tremendous amount of emotional stress when dealing with their disease, which is reflected in high levels of anxiety, depression and other emotional disturbances (Hagan, 1991). The cost of this procedure is relatively high compared with previous methods. The recovery is also slower. Furthermore, patients experiencing CABG surgery would have to stay longer in the hospital; they would have to wait for the surgery and take longer to recover compared with other procedures. As a result, apart from stress from anticipation, patients may face the likelihood that they will be forced to give up their job while waiting. These implications have the potential for psycho-social impact. Therefore, this procedure has become less common in developed countries. However, in less developed countries, where CHD treatment is less rapid and low awareness also contributes to the delay of seeking treatments, CABG surgery still a commonly selected option.

On finding the best method, Saab (2005) reviewed the debates as to which method is best, thrombolytic intervention or angioplasty. He concludes that although thrombolytic therapy is effective during the ‘golden period’, in many cases people

delay seeking treatment. This is the reason that it is not always possible to opt for this method. Angioplasty is able to open more arteries and therefore, is more effective but is less widely available. He concludes that angioplasty, along with anti-platelet therapy and thrombolytic therapy within the first hour, is the best combination.

Hlatky and Mark (2008) observed the economic impact of medical therapies in the US and proposed that PCI should be introduced while patients were receiving catheterisation. In such case, hospital stays would be shorter and costs reduced compared to performing primary PCI as an additional procedure. Based on secondary research of randomised clinical trials of surgery versus medical therapy, CABG surgery is more economical (Hlatky & Mark, 2008). After 10 years, patients with left main disease live on average 19 years longer following CABG than medical therapy, those with three-vessel disease live about six months longer, those with one- or two-vessel disease live about two months longer. Hlatky and Mark (2008) concluded that in patients with severe symptoms, PCI can improve HRQOL and avert some costs, but not among those with mild to no symptoms.

The National Infarct Angioplasty project (Wailoo *et al*., 2010) assessed health service costs as well as estimated health outcomes measured by quality-adjusted life years (QALYs). A total of 3002 patients were included in the analysis, with 2083 patients being treated in nine hospitals providing PCI and 919 control patients from four other hospitals that did not offer this treatment. A total of 67.1 percent of patients were treated with PCI compared with 15.8 percent with thrombolysis, whereas 72.6 percent received thrombolysis and 4.2 percent received angioplasty in the control hospitals. The mean cost for initial treatment of angioplasty is £5146, with an additional of £245 if conducted outside office hours. The mean cost for thrombolysis was lower at £3509 at control sites. However, in terms of QALYs gained, primary angioplasty-based care was cost-effective at a threshold of £20,000. This is most likely to be effective when

patients are admitted directly to the cardiac catheter laboratory rather than via feeder hospital, or if transferred from another hospital.

2.5 Cardiac rehabilitation

Health behaviour is the key in both primary and secondary prevention of CHD. Lifestyle modification to improve survival and the HRQOL following MI that relate to known risk factors is important following MI (Antman & Braunwald, 2008b). In secondary prevention, the aim is to prevent disease progression in patients who already have CHD. The most important of secondary prevention of MI are smoking cessation and control of hypertenstion elements (Antman & Braunwald, 2008b). The risk of non-fatal MI in former smokers falls to a similar level to that in patients who never smoked within two years of quitting smoking (Antman & Braunwald, 2008b). Bethell, Lewin and Dalal (2009) give an example that smoking cessation programmes after MI reduces up to half of the risk of recurring attack, and it reduces the risk of people with angina advancing to MI.

Many research studies have confirmed that a Cardiac Rehabilitation (CR) programme after an MI is beneficial, for example the systematic review by Jolliffe, Rees, Taylor, Thompson, Oldridge and Ebrahim (2006). CR programme aims to help the patient to recover in a short time and to reduce to a minimum chance of recurrence of the cardiac illness (Bethell *et al*., 2009). It is a multidisciplinary intervention for people with heart disease. The CR programme is an important intervention to assist the recovery process and prepare for return to a daily routine. The programme is also important in preventing a second infarct by learning about risk factors, which are explained in the next section.

Bethell *et al*. (2009) also summarised the benefits of the CR programme, which include: increased physical fitness, reduced angina, enhanced coronary blood flow,

improved lipid profiles, lowered blood pressure, improved fibrinolysis, psychological benefits, earlier return to work and improved survival.

CR programmes are recommended for people with MI in the UK, but not in Indonesia, as found in two hospitals in this study. Hospitals in Indonesia offered CR programmes for other circulatory diseases cases, such as stroke or heart failure, or patients who had CABG surgeries. CR programmes in the UK usually last for a few weeks. In these programmes, individuals with MI receive health education in relation to risk factors including diet, smoking cessation, stress management, and exercise. Exercise has the benefit of promoting weight loss, lowering total cholesterol, reducing cardiac effort, reducing platelet stickiness and the risk of ventricular arrhythmias (Brodie, 2001).

Although there are known benefits of CR programme, research suggests that not all cardiac patients are likely to attend. Many studies agree that CR programme in the UK is underutilised (e.g., Bethell *et al*., 2009**,** Swanton *et al*., 2006**).** Attendance has been reported as being between as low as 21 percent and 41 percent (Cooper, Lloyd, Weinman, & Jackson, 1999; Lane, Caroll, Ring, Beevers, & Lip, 2001), with an exception of 78 percent in a study by Yohannes, Yalfani, Doherty and Bundy (2007) which took place in a university teaching hospital.

There have been studies on the characteristics of these non-attenders and drop-outs. Being older has been found to contribute to non-attendance in the UK (Cooper *et al*., 1999) and in the US (Ades, Waldman, McCann, & Weaver, 1992). While Cooper *et al*. (1999) reported that those who were not employed in the UK were less likely to attend, another finding in the US on drop-outs found that they were more likely to be in employment (Sanderson, Phillips, Gerald, DiLillo, & Bittner, 2003). The mixed results may have been due to differences of work constraints across the US and the UK. A study in the US found that the those who did not attend CR programmes due to non-medical reasons were male, obese,

diabetic, smokers and more likely to have less than six-minute walk distances compared with those who attend, while those who did not attend due to medical reasons were in high clinical risk group and have less than six-minute walk distances (Sanderson *et al*., 2003). In addition, in the UK, those who are less aware of their cholesterol level, less likely to believe their condition was controllable, and believed that their lifestyle contributed to their illness, were less likely to attend CR programme (Cooper *et al*., 1999). Thus CR programme attendance has been linked with clinical condition, demographic factors and health beliefs.

Physical activity is not uniform across gender and age. In a pilot study using a small sample, Barker, Tsakirides, Carroll, and Ingle (2009) found a significant difference in physical activity level across gender. Sixteen male and six female post-MI patients were recruited from Leeds General Hospital during their CR programme. Levels of activity were categorised into light, moderate or vigorous. In addition anxiety and depression, and physical self-efficacy were also measured. They found a significant result in the amount of light and moderate exercise across gender, with males performing more physical exercise compared with females. The study found that physical activity decreases with age, and males consistently perform more exercise than women. In addition, Barker *et al*. (2009) found that women who exercise with others had nearly a threefold increase in weekly physical activity compared with those whom exercised alone.

2.6 Global epidemiology of coronary heart disease

Studying the epidemiology of CHD is important in making quantitative predictions of the future of CHD (Epstein, 2005). Epstein stresses that it is also important since these studies, enables measurement of the importance of each risk

factor alone, and combined, as well as the proportion explained within a community, across cultures, and globally based on current trends.

Epidemiological studies of CHD confirm that, although the risk factors for CHD have been identified, the incidence of the disease is still rising in some parts of the world. This is especially so in developing countries, whereas in the past CHD used to be more common in industrial countries. In a WHO report (Mackay & Mensah, 2004), CHD is reported as decreasing in developed countries over the past decade, but increasing in many less developed countries. The report also found that more than two-thirds of the total burden of heart disease worldwide is borne by developing countries. It also states that in developing countries, up to 82 percent of the future mortality is expected to be the result of CHD. Further, mortality rates from CHD have lowered in many western European countries and North America due to improved prevention, diagnosis and treatment, and as a result of public health initiatives. Risk factors have also been decreasing in the industrialised countries, for example reduced cigarette smoking among adults and lower levels of blood pressure and blood cholesterol (Mackay & Mensah, 2004).

A study conducted in the UK on people aged 20 and over who were born outside England and Wales, found that there were different patterns of illnesses among people from different ethnic groups (Whitehead, 1992). Specifically, CHD is more likely to occur in people from the British-South Asian population and is least likely to occur among the British-African population compared with the British African-Caribbean, English, Welsh, and Scottish population (Whitehead, 1992). In 2004 the Department of Health in *The Health of Ethnic Minorities* reported that CHD, the British South-Asian population is more likely to suffer from CHD than the population as a whole. Although the reason behind this is unclear, there are some factors which are prevalent within this community which might be responsible. Namely, high levels of smoking, low rates of exercise and a diet high in fat and low in fruit and vegetables (Department of Health, 2004).

In the US, data from American Heart Association (2002) suggested that African-American women had the highest CHD prevalence of nine percent. The study also found that in general, CHD is highest in the Mexican-American population compared with non-Hispanic white population. The average prevalence of the non-Hispanic white male population is 6.9 percent and in women 5.4 percent; compared with 7.2 percent in Mexican-American men and 6.8 percent in women. Thus, there seems to be a difference in the prevalence of CHD relating to where an individual was born and where they currently reside.

In the year 2002, the top three most populated countries in the world, India, China, and the Russian Federation, had the highest mortality rate from CHD, with India reaching up to 1.5 million deaths (Mackay & Mensah, 2004). This is in contrast to a decade ago when lung disease and diarrhoea were the main and second causes of death (Departemen Kesehatan RI, 2004). In these developing countries, low income is related to CHD mortality and to higher prevalence of risk factors including smoking, diabetes and hypertension (Mackay & Mensah, 2004).

2.7 Risk factors associated with coronary heart disease

The exact causal mechanisms leading to CHD are not yet fully understood, but it is confirmed that CHD is multi-factorial in origin (Orth-Gomèr, Weidner, Andersen & Chesney, 2010). However, the absence of these major risk factors does not free an individual from CHD (Timmis *et al*., 1997).

An epidemiological study of different risk factors for CHD across ethnic groups in the UK was commissioned by the Health Education Authority (Beshion & Nazroo, 1997; Nazroo, 1997). The risk factors are explained below along with many of the findings from this study. There had been a previous study by Marmot, Adleson, and Bulusu (1984) which also included different minority groups. Marmot

classified the British South-Asian population as the Indian subcontinent, which may have over-generalised the different ethnicities, and he is accused of misclassifying ethnic minorities who had been born in the UK as British, based on their country of birth. Nazroo *et al*. (1997) used a more elaborate sampling strategy. Data from the 1991 Census were used as the basis for this study. They carefully selected a sample that included people from minority ethnic groups who lived in an area of low concentration of ethnic minorities. Instead of the straightforward method of asking about country of birth, they asked about self-perceived ethnicity and ethnic family origins (i.e. 'Do you have family origins which are: Black Caribbean, Indian Caribbean, and so on), which were found to be highly related to risk of CHD. The sample was chosen from respondents in the Fourth National Survey of Ethnic Minorities conducted by Social and Community Planning Research (SCPR) (1997), now known as National Centre *for* Social Research (NatCen). Experienced researchers conducted interviews in the language chosen by the participants. Participants could choose to be interviewed in English, Punjabi, Urdu, Gujarati, Hindi or Sylheti. Interviews were conducted either face-to-face or by telephone. Therefore, this study is more sensitive to different ethnicities and to country of birth.

The study by the Health Education Authority was reported in two publications: by Nazroo (1997) and by Beshion and Nazroo (1997). Nazroo mainly reported the following six areas: (1) general health status, (2) cardiovascular disease, (3) other health problems, including diabetes and respiratory symptoms, (4) perceived weight and health related behaviours, including smoking and drinking habits, (5) accidents, and (6) use of health services. Onset of angina and/or MI, were noted to assess the prevalence of CHD. In addition, Beshion and Nazroo explored the heart disease education needs of a healthy population of fifty British-South Asians compared with ten British-whites. Their analysis excluded British-African Caribbean and British-African Asian groups, which were included in the report by

Nazroo. The aim in Beshion and Nazroo study was to find out how personal behaviour had changed following changes in health beliefs or health information, and to find out the influence of different sources of information, such as family members, the community, health professionals, the media and from formal education. Further explanation regarding this study is given in Chapter Three (see section 3.4).

There were inconsistencies in this study compared with other studies. Nazroo points out that, in previous studies using mortality rates, Balarajan (1996) used country of birth, which may have overlooked minority ethnic groups who were born in the UK. Also, his study measured morbidity rates. He argued that there are many factors contributing to the different rates of mortality, such as access to treatment, disease progression, and social factors. Finally, there might be cohort differences between the sample in this study and previous studies.

The traditional risk factors for CHD are diabetes, hypertension, hyperlipidimia, and smoking. They are important because they are common. Also, it has been shown that successful treatment of them improves outcome. Physical inactivity and obesity should be corrected as well, but these two risk factors exert part of their detrimental effect through the four major risk factors listed. Some risk factors, such as age and a positive family history, cannot be modified (Waters, 2010). These risk factors can be grouped as major risk factors and risk factors related to psychosocial aspects, as well as the combinations of these risk factors. They are explained below.

2.7.1 *Major risk factors*

There are several medical risk factors which lead to the development of CHD. The risk factors are: hypertension, dyslipidaemia, diabetes, smoking, obesity and lack of exercise. These major risk factors are important to the development of

CHD. For example, the reported lower incidence of CHD in some countries in Asia, i.e. China, Hong Kong, Thailand and Japan, may be explained by a difference in fat intake, smoking, diabetes, and blood pressure (Reddy, 2005).

2.7.1.1 Hypertension

Hypertension is a condition where blood pressure rises persistently above the normal level, and having hypertension doubles or triples the risk of developing CHD (Timmis *et al*., 1997). It makes the myocardium work harder, thereby using more energy for pumping and meeting increasing myocardial oxygen needs, which increases the risk of CHD. Furthermore, treatment of hypertension provides some protection against CHD, although it gives better protection against stroke and heart failure. The BHF recommends that drug treatment combined with weight loss, lower consumption of salt and alcohol intake and physical activity can decrease blood pressure (Allender *et al*., 2008).

2.7.1.2 Hyperlipidaemia

This CHD risk factor is caused by an interaction of both genetic and environmental factors. The abnormal level of fat in blood is due to a rise in plasma lipids. Timmis *et al*. (1997) explain that CHD risk rises in proportion to the total blood cholesterol level. They explain that low density lipoprotein is the major component of total cholesterol and is particularly atherogenic; high density lipoprotein protects against the disease. Reducing total cholesterol levels, and the ratio of low and high density lipoprotein in the healthy and CHD population reduces risk. It also slows down the progression of existing coronary artery disease and, in some cases, leads to a reduction of atheromatous plaques. Although hypercholesterolaemia is not a common risk factor, when there is a presence of low levels of high-density lipoprotein it may increase risk, particularly in women.

From a review of many studies in Asian countries, some of which were based on his own research, Ueshima (2005) found that in the Westernised Asian countries, such Singapore and Hong Kong, CHD mortality rates are higher compared with other Asian countries. Although Japan and Taiwan are industrialised countries, they showed a similar trend in being the lowest CHD countries. Ueshima found that Thailand has the lowest CHD mortality rates among Asian countries. He also found that between Asian countries being researched and the Western countries, risk factors for CHD are generally similar. The apparent difference lay in the fact that serum total cholesterol was much lower in Japan, but even lower in China, Taiwan, and Korea (Ueshima, 2005).

2.7.1.3 Diabetes

Diabetes is linked with the development of CHD. Based on the publication by WHO (2005), their 2003 survey revealed that 3.9 percent of the UK population suffer from diabetes, compared with 5.9 percent of the people in India; and 1.9% of the people in Indonesia. Data from the WHO, based on the estimation in the year 2000, ranked India as having the highest estimated cases of diabetes with 31.7 millions. China followed with 20.8 cases, followed by the US (17.7 million), and Indonesia (8.4 millions) (Wild *et al*., 2004). Diabetes in the UK has been on the increase since 1991, during which time it has more than doubled, from two percent to 5.6% among men and from two percent to 4.2 percent in women (Joint Health Survey Unit, 2008).

2.7.1.4 Smoking

Smoking is the single most preventable cause of death in today's world and it was the cause of 100 million deaths worldwide, 5.4 million annually (WHO, 2008a). Of more than 7.5 million deaths due to ischaemic heart disease, 15 percent of these deaths are related to tobacco consumption (WHO, 2008a).

Smoking damages the lining of the coronary arteries by increasing the development of fatty deposits. It also makes the blood stickier and may lead to thrombosis in the arteries. Furthermore, the smoke produced contains carbon monoxide, and red blood cells have a greater affinity for carbon monoxide than oxygen resulting in a lack of oxygen in the blood.

Smoking rates in Eastern countries are relatively low compared with Western countries. Data collected in from the WHO report (Mackay & Eriksen, 2002), showed that smoking among males in Asia is very high. For example, the prevalence is China, 66.9 percent; Cambodia, 66 percent; Indonesia, 59 percent; Bangladesh, 53 percent; and Singapore, 26.9 percent. However, the percentage of female smokers in most Asian countries is relatively low compared with the Western world. For example, India, 2.1 percent; Singapore, 3.1 percent; Indonesia, 3.7 percent; China, 4.2 percent; Japan, 13.4 percent; with a very high percentage found among Myanmese women, 22.3 percent; Bangladeshi women, 23.8 percent; and Nepalese women 29 percent. The general figures of female smokers in Asia are far lower than those of Western countries, such as the US, 21.5%; and the UK 26 percent. The smoking rate in some industrialised Asian countries, such as Singapore, Japan, Taiwan, Hong Kong, and China, may explain the similarities between trends in the incidence of CHD in Western countries where mortality continued to rise until around 1980 and then started to decrease (Reddy, 2005).

2.7.1.5 Obesity and unhealthy diet

Obesity is defined as a Body Mass Index, a measure of weight corrected for height that correlates with body fat, as higher than 30 kg per square meter (Dyer, Stamler, & Greenland, 2005). There are over 250 million obese individuals globally (WHO, 2002).

Obesity is related to an unhealthy diet. Unhealthy diets contribute up to 30% towards deaths from CHD (Allender *et al*., 2008). The role of smoking in the development of atherosclerosis is multiplied by an adverse diet (Stamler, Neaton, Garside, & Daviglus, 2005). Unhealthy diet, as a contributor to CHD risk factors, consists of continuous consumption of: high animal products, high in total fat, hydrogenated fat, high in cholesterol, saturated and trans fatty acids; high in refined and processed sugars, high in salt, high in alcohol, high in calories, low in grain products, fruit, vegetables and legumes (Stamler *et al*., 2005). A diet that is high in animal fat can increase plasma cholesterol levels since saturated fat is found in animals and much less commonly in vegetables. A diet high in saturated fat will lower the synthesis of cholesterol by the liver. An increase in the plasma cholesterol level results in a high risk of atherosclerosis and an increased risk of CHD. High density lipoprotein can reduce the risk of CHD by removing the excess cholesterol from the tissue and transporting it to the liver where it is removed from the circulation. On the contrary, low density lipoprotein contributes to the development of atheroma and therefore increases the risk of CHD. Triglycerides are another type of fat which are available from the diet and are synthesised in the liver. A high level of triglycerides is associated with low density lipoprotein and has a tendency to cause thrombosis (Sapolsky, 2000). In the BHF report, British adults derive around 37 percent of food energy from total fat, and between 14 to 15 percent from saturated fat (Allender *et al*., 2008).

2.7.1.6 Sedentary lifestyle and physical inactivity

There are many benefits of exercise. Exercise has the advantages of reducing the total cholesterol, increasing high density lipoprotein and decreasing triglycerides. Furthermore, exercise will reduce the work of the heart, reduce blood clotting by decreasing blood platelet stickiness, reduce the risk of ventricular arrhythmias, improve glucose/insulin dynamics and improve mood (Brodie, 2001). Based on

best evidence the government recommends 30 minutes of moderate exercise five times per week for adults (Allender *et al*., 2008).

The modification of these major risk factors has contributed to the decline in CHD mortality rates. In the UK, there has been evidence that the CHD mortality rate has decreased over the past two decades (Unal, Crithcley, & Capewell, 2004). In England and Wales, between the years 1981 and 2000, there was a 67 percent fall in mortality among men and 45 percent among women aged between 35 and 84 years. Using data from published trials, meta-analyses, government statistics, clinical audits, and national surveys, Unal *et al*. (2004) summarised the main reasons for the decline. Medical and surgical treatments, such as aspirin, thrombolytic and cardiopulmonary resuscitation prevent 41.8 percent of deaths from MI. Risk factor modification resulted in a 58.2 percent fall in deaths. Among the decline in risk factors, a 34 percent reduction in smoking contributes up to 48 percent lower mortality rate. However, the increasing trends in obesity, physical activity, and diabetes contribute to more deaths in their model. Obesity has the sharpest increase: a 186 percent higher rate contributing to 4.7 percent more deaths (Unal *et al*., 2004).

2.8 Psychosocial influences

In 1980, a government report known as the 'Black Report' (Townsend & Davidson, 1992) was published, followed a few years later by the 'Health Divide' (Whitehead, 1988), which confirmed that there is a link between ill-health and material deprivation. These reports led to further research on psychosocial influences in relation to illness.

Psychosocial influences can be defined as independent risk factors that act by directly affecting physiological parameters and by affecting behaviours that are

associated with increased risk (Orth-Gomèr *et al*., 2010). Individual characteristics and social and environmental influences, are linked with CHD and cardiovascular disease in general, and are explained below.

2.8.1 *Individual differences*

Individual characteristics are linked to CHD. These include certain personality dimensions, age, gender, ethnicity and genetics, which are explained below.

2.8.1.1 Personality type/behaviour

Almost half a century ago, two cardiologists, Rosenman and Friedman, conducted research and concluded that there were certain characteristics more likely to be found in people with heart disease. This related to occupational stress and socio-economic stress, which seemed to be apparent in certain social classes in Western society (Rosenman & Friedman, 1959). Later this personality pattern was termed 'Type A' personality. Many studies have linked Type A personality with CHD. Type A is characterised by heightened ambitions, competitiveness, easy provocation, time-pressure, impatience, and hostility (Rosenman, Friedman, Straus, Jenkins, Zyzanski, & Wurm, 1970).

The Western Collaborative Group Study was a longitudinal study of 3182 men in San Fransisco beginning in the year 1960 and examining twenty-one potential CHD risk factors (Rosenman *et al*., 1970). Rosenman, Friedman *et al*. then compared these risk factors in the 133 men between the ages of 39 and 59 who eventually developed CHD with those who did not. Of those who developed CHD, 29 had angina pectoris, 104 had MI, and 31 a 'silent' or a clinically unrecognisable type of CHD. Among the potential risk factors of CHD, level of education, parental history, blood pressure, smoking, cholesterol level, lipoproteins, and the Type A behaviour pattern, were associated with a higher

incidence of CHD. The Type A men had a twofold risk of developing CHD compared with the Type B, even when blood pressure, serum lipids, cigarette smoking, obesity, and other influences were controlled. The findings by Rosenman and Friedman in the next few decades led to many research studies on the Type A behaviour pattern.

However, more recent research has raised various questions about Type A behaviour pattern as they yielded mixed findings. For example, analysis based on previous contradictory findings by Lachar (1993), concludes that some aspects of coronary-prone behaviour may lead to the development of CHD, but not the global Type A behaviour pattern. Coronary-prone behaviour in her study, characterised as physiological and emotional reactivity in challenging situations, was associated with anger, cynicism, mistrust and suppressed or expressed hostility.

Hostility, conceptualised as suppressed anger, was found to be specifically related to CHD. Barefoot, Dahlstrom, and Williams (1983) indicate that hostility is the main ingredient in the Type A behaviour pattern and is a significant predictor of CHD. Hostile persons react strongly to situations perceived as provocative. Sapolsky (2004) suggests that the connection between hostility and CHD includes a link with smoking, poor diet and excessive drinking. Moreover, hostile people may not have adequate social support due to their hostility.

In another study, De Leon and Meesters (1991) also failed to establish the relationship between Type A behaviour and CHD. They conducted a research study on Caucasians who just had an MI compared with 26 individuals with orthopaedic problems as a control group, in the same hospital. Those with an MI were divided into 32 people with diagnosed MI and 26 people with unstable angina pectoris. Those with MI failed to show a significant difference from the control group, when measured using the Jenkins Activity Survey to measure Type A behaviour pattern. However, they did find those with MI expressed more anger

when measured with the Anger Expression Scale. A higher tendency for time urgency, impatience, and irritability before the attack were also reported in the study by De Leon and Meesters (1991). They concluded that those with first onset of MI showed a stronger association with overall Type A behaviour pattern, general trait anger and outward anger expression, than those with a recurrent infarct.

Further research found that more specific characteristics or situations among people with Type A behaviour were more directly linked with CHD. For example, one of the mulplicative effects of Type A behaviour, vital exhaustion, was found to be a predictor of the onset of MI. Using the Maastricht Questionnaire, Appels (1991) distinguished those with Type A behaviour from Type B. He recruited 3877 Dutch males working in Rotterdam between 1979 to 1980, aged between 39 and 65 years. Their blood pressure, cholesterol level, glucose tolerance, weight, smoking, and the presence or absence of angina were examined. Fifty-nine of this sample suffered a first MI within the period of study, adding a total with 133 males with MI. Exhaustion was found to significantly predict MI, even after controlling for use of anti-hypertensive drugs. This group was then compared with 133 age-matched neighbourhood referents and 192 age-matched hospital referents from different departments. Individuals with MI were found to have a two-fold risk compared with the control groups, exhausted individuals had a seven-fold risk compared with the control groups, and those with combined exhaustion and Type A behaviour pattern had an eleven-fold risk compared with the control groups. Vital exhaustion, which includes fatigue and loss of vigour is commonly found. However, 'depressed mood' which is a symptom in depressive disorder was rarely mentioned. In cases of depression, avoiding company is related to avoiding confrontation between the other person's happiness and their own misery; whereas in exhausted participants, the reason is due to tiredness. Individuals who were depressed were also tired, but exhausted participants did not have depressed mood.

He suggests that vital exhaustion may be due to sleep problems. Appels concludes that vital exhaustion in people with Type A behaviour pattern mediates the risk of CHD.

2.8.1.2 Age

Older age appears to be related to higher mortality. Among men and women older than 65 years of age, cardiovascular disease is the most frequent diagnosis (Schwartz & Zipes, 2008). Global trends of people surviving to 65 years and older is increasing. In 2030, it is estimated that there will be an increase to 973 million or 12 percent (Schwartz & Zipes, 2008). This trend will be greatest among the undeveloped countries. It is estimated that among those older than 80 years there will be twice as many women as men and among those older than 90 years there will be up to three times as many (Schwartz & Zipes, 2008). Until age 80, there is an equal number of women and men with MI, after which, women are more likely to have MI (Schwartz & Zipes, 2008).

Allender *et al*. (2008), in the above-mentioned BHF report, found that the age-specific death rates per 100,000 of the population were: between the age of 35 and 44, there were 20 deaths among men and 4 among women; between 45 and 54, there were 93 deaths among men and 19 among women; between 55 and 64, there were 271 deaths among men and 79 among women; and between the age of 65 and 74, the death rates were 763 in men and 328 in women. Asian, but not Chinese and Hong Kong people, develop CHD at a younger age compared with European, Chinese and Chinese-Hong Kong people (Yusuf *et al*., 2004).

2.8.1.3 Gender

Men are more likely than women to develop CHD, but the gap is closing in the older age group (Timmis *et al*., 1997). The Health Survey for England 2006 (Joint Health Survey Unit, 2008) suggests that about four percent of men compared with

half percent of women in England suffer a heart attack. This survey suggests that heart attack is highest in men aged 75 or over (16.6%) and in women aged 65-74 (1.2%). In the UK, 673,000 men between the age 35 and 75 had an MI compared with 178,000 women.

Although the risk of developing CHD is low for younger women, the risk in elderly women is more similar to that of men. In those aged 75 years and older, one in three men and one in four women has CHD. This is due to the protection afforded by the female sex hormones (Sapolsky, 2004; Timmis *et al*., 1997).

There is a reducing gap in the incidence of CHD between males and females as they get older (Witt & Roger, 2004). The WHO report (Mackay & Mensah, 2004) stated that women with heart disease in developed countries are less likely to be referred to a heart specialist, to be hospitalised, to be prescribed medicine or invasive treatment, or to be referred for testing. However, they are more likely to receive medical attention following a second heart attack. This WHO report also states that, even though men have a higher rate of MI than women, evidence shows that the death rates in men have been declining. Based on this report, in total, CHD kills about 3.8 million men and 3.4 million women worldwide every year.

There are some explanations of why death from CHD has been rising among women while the trend is the reverse for men. Firstly, women face a higher risk from smoking than men (Mackay & Mensah, 2004). Secondly, Sapolsky (2004) adds that there is a difference in exposure and reactions to stress that may also be a factor. The reason for this is that oestrogen works as an antioxidant to protect against heart disease. However, he also states that stress suppresses oestrogen levels and this could contribute to cardiovascular diseases as oestrogen in women does not reverse existing atherosclerosis, but rather prevents the formation of atherosclerosis in the first place. This explains why the risk of heart disease

increases in females and reaches the same level as that of males following the menopause. Thirdly, high triglyceride levels are a cause of atherosclerosis among women, but not in young men (Mackay & Mensah, 2004). In addition, oral contraceptive use, hormone replacement therapy, polycystic ovary syndrome and a higher risk of heart attack early in each menstrual cycle are additional risks for women (Mackay & Mensah, 2004).

2.8.1.4 Ethnic origin

Some ethnic groups are more prone to CHD than others. In the UK, British South-Asian and British African-Caribbean minority ethnic groups have the highest rate of diagnosed CHD (Nazroo, 1997). Nazroo reported that among minority ethnic groups, four percent reported a diagnosis of CHD. In combined British South-Asian groups, four percent reported a diagnosis of CHD. The combined British South-Asian and British African-Caribbean group were found to report the highest rates. There were also variations within the British South-Asian groups, with British-Pakistani and British-Bangladeshi people reporting the highest rate and British African-Indian people the lowest. Nazroo then compared these results with those of British-Whites, after first standardising the age profiles of the ethnic minorities, due to the discrepancies compared with the age profiles of the British-Whites. As a consequence, in order to achieve a similar age and gender structure, the British-Indian and British African-Indian groups, as well as the British-Pakistani and British-Bangladeshi groups were combined. He found that the highest rate of diagnosed CHD was among the combined British-Pakistani/Bangladeshi groups. Among this combined group, the rate was almost 50% higher than British-Whites. Surprisingly, the other British-Indian/African-Indian groups had similar rates of diagnosed CHD compared with British-Whites. Lower rates of CHD compared with British-Whites, but not significantly, were reported among British African-Caribbean and British-Chinese participants.

Nazroo consistently asserts that diagnosed CHD can under estimate the actual cases as people may not always realise they are having an MI or they may ignore the symptoms. Due to this reason, he asked people aged 40 or over about their experience of persisting and severe chest pain. Similar to the above result, British-Pakistani/Bangladeshi people reported an even higher figure of 80% of diagnosed CHD.

In the US, a study of CHD risk factors among ethnic minorities in the US by Gillum, Mussolino and Madans (1998), involved following 1641 healthy African-American respondents and 9660 White-American respondents between the ages of 24 and 74 for two decades. They found that age, systolic blood pressure and smoking among the African-Americans, and low family income among American-Whites were independent risk factors for CHD.

Other than parents with CHD, factors also included high cholesterol levels, diabetes, hypertension, high fat intake and familial hyperlipidaemia.

2.8.1.5 Family history

Having parents with CHD also contributes to CHD risk. Marenberg, Risch, Berkman, Floderus and de Faire (1995) investigated genetic mechanisms of having family history of CHD by using twins in Sweden. They studied 3298 monozygotic male twins and 4012 female, and 5964 dizygotic male twins and 7730 female twins. After 26 years, Marenberg *et al*. found that among 1649 pairs of monozygotic male twins, 114 pairs died from CHD and 335 did not both died from CHD. Of 2982 pairs of dizygotic male twins, 164 pairs both died from CHD compared with 705 pairs who did not. Among 2006 pairs of monozygotic female twins, 164 pairs were concordant and 705 pairs were disconcordant for death from CHD, and among 3865 dizygotic female twins, 99 pairs were concordant compared to 611 discordant. This result revealed that deaths from CHD were

more common among monozygotic twins than dizygotic, suggesting a genetic factor in death from CHD. Furthermore, they found that this genetic factor is more influential in deaths at a younger age.

2.8.2 *Social factors*

Low socio-economic status, stress and work-related stress, and social isolation have been linked to CHD.

2.8.2.1 Stress

Stress has also been linked with CHD. Excess stress can cause hypertension and atherosclerosis, which can lead to CHD. Sapolsky (2004) explains that the stress-response causes the heart excess work for a temporary period of time. Chronic stress results in hypertension. He further explains that when the inner lining of the vessels is damaged due to the continuous increase of blood pressure, the immune system cells will repair the area and cause inflammation. In addition, cells with fatty nutrients begin to form there. The difference in bodily functions during stress and exercise is that during exercise, there is great vasodilation in the working muscles resulting in a reduction in peripheral resistance. This is the result of vasodilative substances that are released in response to lowered oxygen tension. In contrast, stress increases peripheral resistance. Therefore, diastolic blood pressure is reduced during exercise, but increased as a stress response.

Stress can also increase atherosclerosis. Sapolsky (2004) explains that during stress, the release of adrenaline increases the heart rate. Faster blood pumping induces thrombosis and, in the long term, thrombosis may damage the lining of arteries. He adds that high cholesterol alone cannot cause CHD when there are no damaged vessels for blood clots to stick to, causing atherosclerotic plaque. Thus, he concludes that a high cholesterol level does not necessarily progress to an MI. Not surprisingly, a high cholesterol level only appears in about half of MI patients.

On the contrary, inflamed blood vessels are a better predictor of CHD because plaques may appear despite a healthy cholesterol level when there is sufficient vascular damage. Sapolsky gives an example that an obstruction in the coronary arteries will result in a MI, and an obstruction in the cerebral arteries will result in a cerebral (brain) infarct, known as a stroke. In ideal conditions, excitement will trigger the sympathetic nervous system causing heart rate increases and the myocardium will consume more energy and oxygen. To supply this, the coronary arteries will dilate to allow more nutrients and oxygen access to the muscle. However, he adds that stress can worsen a pre-existing problem when atherosclerosis is present. Instead of dilating, acute stress blocks the clogged coronary arteries even more. Following continuous stress, the heart will need more time to return to the steady state. This makes it hard for the heart to slow down, even during the absence of stress. Sapolsky concludes that the flight-or-flight response is adaptive to acute stress, but may be maladaptive in chronic stress in the modern world. This suggests that a pre-existing medical condition alone may not necessarily lead to CHD, without the presence of psychosocial factors.

Work-related stress is one of the main stressors in the modern world for many working individuals. There are several potential stressors in the workplace (Hartung & Penn, 2004) which include the nature of work and work environment, e.g. posture, noise, shift work, level of social contact, organisational factors, e.g. time pressure, decision making, career structure and personal factors, e.g. role conflict, work-home balance.

Some models have been generated to explain how job characteristics affect health. The most widely used is probably the Job Strain model proposed by Karasek (1979). The model concentrates on two aspects of job characteristics at the individual level, (1) demands as a worker (job demands), and (2) how far the worker is allowed to make decisions to meet the demands (job control). Job Strain is the result of having a combination of demanding work situations (high demand),

and a narrow range of decision-making freedom (low control) in meeting the demands. Later, Karasek, Brisson, Kawakami, Houtman, Bongers and Amick (1998) developed the Job Content Questionnaire with scales measuring psychological demands, decision latitude, social support, physical demands, and job insecurity. They tested the questionnaire in the US, Japan, Canada and the Netherlands. The results show moderate reliability for most scales. Karasek, Theorell *et al*. conducted many studies on job strain in Sweden and in the US. For example, Karasek, Baker, Ahlbom and Theorell (1981), analysed job decision latitude and job demands, and related them to the risk of developing CHD. In one study, they measured a large random sample of Swedish working men. They concluded that the risk of developing symptoms and signs of CHD and cardiovascular death is higher in psychologically demanding jobs. There were quite a large number of workers with low education: 57 percent in the general working population, but as high as 75 percent in the older generation. For this group, having low personal schedule freedom alone, or coupled with high job demands, is a significant predictor of CHD and cardiovascular death. Further, in a different study, they relate different psychosocial and physical job characteristics to MI risk.

Alfredson, Karasek and Theorell (1982) analysed 334 working Swedish males below the age of 65 with MI and compared them with a control group of 882. They found that shift work, defined as continuously changing day and night work schedules, and monotonous types of work were found to be associated with excess risk of MI. A hectic job, when combined with a low measure of control and growth, along with some physical variables, resulted in higher risk. Karasek *et al*. (1988) have also examined this in the US. They examined male workers through national surveys in the Health Examination Survey (HES), and Health and Nutrition Examination Survey (HNES). There were 2409 males from the HES, and 2424 from the HNES, almost 90% of whom were white males. Job

characteristics were estimated from the US Department of Labour Quality of Employment Surveys, and applied to each person's occupational census code in both surveys.

These surveys are not identical, as there are variables, such as smoking, that are found in only one of the studies. In the HES, the presence of MI was judged by a clinical panel of doctors based on participants' electrocardiograms, chest X-rays, medical history, and blood chemistry, while in the HNES, CHD diagnosis was based on field examination and medical history, a detailed cardiovascular questionnaire, and physical examination. Occupations with high decision latitude, (e.g. executive and professionals), low status with low demands, (e.g. janitors and watchmen), low demands and high in decision latitude, (e.g. repairmen, natural scientists, linemen, and craftsmen), were excluded from the study. Their findings were consistent with previous studies, i.e. that occupations with high job strain resulted in higher risk of MI, with the exception of 45 to 54 year olds in the HES, where high job strain resulted in lower prevalence of MI. When Karasek *et al*. (1988) measured the overall rate of high strain jobs and the estimate of underlying odds for MI; they only controlled for age, and were not able to control other risk factors of MI, such as race, blood pressure, cholesterol and smoking. This analysis showed that after controlling for age, job strain is able to explain between one-fourth and one-third of the MI prevalence across these samples.

Several studies have shown that work-related stress may have physiological consequences which may lead to CHD. As early as 1958, Rosenman and Friedman found evidence that work-related stress, most commonly found in industrialised Western males, may induce rises in plasma cholesterol level. They conducted research with equal sized groups of tax and corporate accountants, and found that during the deadline for filing tax returns in April, both groups showed a rise of plasma cholesterol. In addition, there is a rise of plasma cholesterol among the corporate accountants in January where there is a similar workload expected,

but not in the tax accountants where this is not applicable. Further, they suspected that this is particularly true in individuals that have certain characteristics, such as ambition, conscientiousness, aggressiveness and inability to adapt easily to the environment. This led to the concept of Type A personality, which was linked with CHD and is discussed in section 2.8.1.1. A longitudinal study of 195 men living and working in New York City was followed over the period of 1985 to 1988 (Schnall, Schwartz, Landsbergis, Warren & Pickering, 1998). This study examined the relationship between job strain and blood pressure. Job strain was measured with a valid Job Content Questionnaire (Karasek *et al*., 1998) and Type A Behaviour Pattern was measured using Jenkins Activity Survey (Jenkins *et al*., 1971), which has moderate validity but lacked sensitivity to "...predict individual cases or even to discriminate between small groups of cases and non-cases...(p. 611)" (Jenkins *et al*., 1971). Schnall *et al*. (1998) found that the group of 15 men with high job strain had a higher blood pressure compared with a group of 138 men without job strain consistently at Time 1 and at three-year follow-up. A recent nationwide study of 1030 young Finns (Hintsanen *et al*., 2005) measured the relationship between job strain using a combination of valid Occupational Scores Questionnaires to measure job control, which has been used widely in Finland and Job Content Questionnaire to measure job demand. They also measured social support using the Perceived Social Support Scale-Revised. They managed to study the early phase of atherosclerosis without any manifest symptoms of cardiovascular disease using ultrasound. They found that among men but not women, there was a strong association between job strain and development of atherosclerosis after controlling for age, social support, socio-economic status, smoking, alcohol consumption, physical activity, body mass index and serum cholesterol level.

Other syndromes related to work-stress also include workaholism and job burnout. Maslach and Jackson (1984) initially discovered these issues and did many studies

in these areas. Workoholism is an obsession with one's work, and job burnout is characterised by emotional exhaustion, depersonalisation, and a low sense of work efficacy. Job burnout is defined by Maslach and Jackson (1984) as "…a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people in some capacity" (p.134). This definition of burnout derived from empirical research of Maslach's earlier work on emotions, rather than from a theoretical framework.

2.8.2.2 Social isolation

Social network deficits and low perceived social support are related to survival and recovery in people with MI (Pitula, Burg & Froelicher, 1999). Social isolation can result from a perception of unsatisfying relationships with others that limit efforts at social outreach, as well as a consequence of death, divorce, or relocations; (Pitula *et al*., 1999).

Having social support is related to improved well-being. A recent study involving Portuguese people by Figueras and Weinman (2003) on the illness beliefs of MI patients and their spouses, found that illness beliefs were strongly related to the patients' well-being. Spouses with similar perceptions to their partners exhibited enhanced social, physical, psychological and sexual functioning.

A meta-analysis of studies by Lowe *et al*. (2002) examined psychosocial factors involved in CR programme. They highlighted the issue of gender differences in terms of the type and sources of support, despite the fact that social support increased the success of recovery in both males and females. This means that women were less likely to have a spouse by the time they had their heart attack since, in most cases women develop CHD at a later age than men and they usually live longer. This may have been the reason that women reported more social isolation than men (Kristofferzon, Löfmark & Carlsson, 2005). Women reported

to have less social support up to one year after an MI compared with men. They also reported to receive less information about their disease and CR programme. In this study, they also found that women experienced lack of belief in their heart problems from family caregivers. In addition, they also received less assistance with household duties from family caregivers.

2.8.2.3 Socio-economic status

People with low socio-economic status have poorer health and are less likely to receive treatment. Mackay and Mensah (2004) in the WHO report, conclude that lifestyle, access to healthcare, and chronic stress, are possible explanations for how socio-economic status links with CHD, as well as a lower reported use of medication, lipid-lowering agents, ACE inhibitors and investigations, such as cardiac catheterisation in lower socio-economic groups. In the BHF report (Allender *et al*., 2008) it is reported that Scotland and the North of England have the highest death rates from CHD in Britain. In Scotland, premature death among men is 65 percent higher than the South West of England and even higher, 112 percent, among women. Regarding social class, male non-manual workers have 50 percent higher rate of CHD compared with male manual workers, and 125 percent higher rate of CHD in women (Office for National Statistics, 2003). It is concluded that about one in three of CHD deaths among those under 65 years of age is the result of social class inequalities (Allender *et al*., 2008).

Unfortunately, as reported by Mackay and Mensah (2004), there are different mortality rates in relation to socio-economic status. As mentioned earlier in this chapter, this is a common case in developed industrial countries such as the UK, where unskilled manual workers are more likely than professionals to die prematurely from CHD, whereas in developing countries, it is more common in the educated and higher socio-economic groups (Mackay & Mensah, 2004; Wilkinson & Marmot, 2006).

In the two famous studies, the Black report by Sir Douglas Black (Townsend & Davidson, 1992) and the later Health Divide by Whitehead (Whitehead, 1992), they used social or occupational class, which is based on the skills and the status of the job, and socio-economic group, which brings together people with similar skills and lifestyles. The five social classes may not be a precise measure, but it is still the most widely used. Whitehead (1992) argues that an occupation can serve as a guide to an individual's social position, similar types and level of and resources, shared perception of their condition and standard of living.

The Black Report (Townsend & Davidson, 1992) found that the lowest occupational class at any age was more likely to die than those in the higher occupational classes. Males, regardless of occupational class, were found to be twice as likely to die prematurely as females. House owners were more likely have a lower mortality rate compared with those who rent from private landlords. However, the latter still had lower mortality rate when compared with those who were tenants from local authorities. The partly skilled and unskilled manual workers also had less consultation with their general practitioners compared with the manual workers, which suggests that the middle class made better use of health care than the lower class.

Whitehead (1992) did a follow up study almost a decade later focusing both on inequality, which generally looked at the gradient in the whole population, and deprivation, which specifically looked at the most disadvantaged subgroups, whose welfare was worse than the national average or below a minimum standard of the society in which they lived. She compared the data from previous studies with her data on social inequalities in the UK between the years 1979 and 1992. Whitehead measured the classes and socio-economic factors against the ratio of death rates to the relative chance of death at a particular age to measure length of life. She included data on HRQOL measures whenever available. Her results suggest that unskilled workers from the year 1979 to 1983 had at least twice the

risk of death from CHD and other major and minor fatal diseases compared with professionals, most strikingly in the younger age group, which also applied to married women. Marmot *et al*. (1984) in their study found an even higher (three-fold) difference, suggesting that the national data may underestimate the social group differences. However, both of these studies agreed that diseases affected the most disadvantaged more than the rich.

The Black Report was criticised for emphasising only mortality rates. Whitehead included reviews of other studies which included housing tenure and car ownership. She found that house ownership was a better indicator of health than social class, as owner-occupiers were found to have lower mortality rates compared with council tenants, regardless their social class. Her reviews also found that those who were resident in the North and Midlands of England had worse health compared with the South, although this may be too broad a classification as there were differences within areas. Unemployment was also linked with worse health.

Whitehead (1992) concludes that social inequalities are real, and blaming ill-health on genetic factors is also not strongly supported as changes in health have occurred much too quickly to be explained by genetics alone. She argued, therefore, that lifestyle seems to explain why lower social groups are likely to adopt unhealthy options. Whitehead concluded that different studies clearly illustrate that social context influences behaviour. Therefore, living and working conditions can limit an individual's choice of healthy lifestyle. Despite criticisms that health differences were due to individual personal choice of healthy behaviour, such as smoking and alcohol consumption, both studies were able to show there were differences in health even after controlling for smoking, alcohol abuse or lack of exercise. They also argue that individual choice of lifestyle is influenced by the media among other things, which can be controlled by the government (Townsend & Davidson, 1992; Whitehead, 1992).

Marmot *et al*. (1984) were the first to conduct a study focusing on people born outside England and Wales, and excluded the minority ethnic groups who were born in England and Wales. Previous studies used country of birth to differentiate ethnic groups, and this raised questions for the British-born ethnic minorities. This study used Gross National Product (GNP), which is not an indicator of living standard, but rather of economic development. It can be seen that those with a per capita GNP higher than US$ 10,000 for example, Japan, US, the UK and Singapore, also have a life expectancies of higher than 75 years of age, with Japan having the highest at 80. In the middle, with US$ 1,000-10,000, Peru, Thailand, Brazil, and South Korea have life expectancies around 65 to 74 years of age.

Blackburn (1991) suggests ways that low income may affect health: (1) physiologically, (2) psychologically, and (3) behaviourally. Physiologically, low income reduces the options to accommodate adequate housing, food, and in some cases, medicine and treatment, which results in stress in coping with this situation psychologically. At the behavioural level, poverty results in health-damaging behaviours such as smoking, and also reduces choices in terms of buying power e.g. to afford a healthy diet which tends to be more costly (Blackburn, 1991).

Arber and Lahelma (1993) studied socio-economic inequality in health in the UK and Finland, and found that there were strong socio-economic inequalities among British men, compared with Finland. They conclude that socio-economic status becomes strongly related to health for both men and women in countries where females are expected to work. However, this is not the case in countries where there is less expectation for women to work, as females' family roles and housing characteristics become more important than socio-economic level.

2.8.3 *Interaction effect of different risk factors*

The individual risk factor explained above may also have an interaction effect of these different risk factors. For example, the relationship between socio-economic position and health shows a different direction in different age groups (Robert & House, 2000). Robert and House propose explanations as to why in older age there is a small difference in health according to socio-economic group: (1) older people are more likely to receive health and social benefits, (2) those from low socio-economic positions who survive to older age are more likely to be those with excellent health, (3) it is likely that this age variation in socio-economic status mediates psychosocial, behavioural and environmental factors, which are known to affect health, (4) it is possible that the measurement of socio-economic level may not be most appropriate for older ages, (5) there may be a contrast between biological differences that limit the ability of socio-economic level to influence health between younger to older group.

The interaction between age and gender has also been reported. As reported in the Health Survey for England 2006 in the National Centre *for* Social Research, (Craig, 2008), hypertension increases with age and is more common in men, although the difference is less in the older groups. For example, in the 16 to 24 age group, three percent of men and one percent of women have hypertension compared with 66 parent of men and 69 percent of women in the 75 years and older group.

Furthermore, there is also an interaction between both gender and socio-economic level to morbidity. Women are more likely to be in the lower socio-economic groups and have higher morbidity. Robert and House (2000) point out the debate on whether classification of married women should follow their own socio-economic status, follow their husbands, or both. An explanation of the ethnic difference in socio-economic status may be due to the different importance or

sensitivity accorded to socio-economic measures in different ethnic groups (Robert & House, 2000). As an example, in some cultures where there is cultural discrimination towards gender, coupled with economic disadvantage, this may increase health risks in certain groups (Lane & Cibula, 2000). In the US, the death rate from CHD among African-American women is 65 percent higher than for American-White women (American Heart Association, 2002). This is related to a higher prevalence of hypertension, obesity and diabetes mellitus (Mieres, Kelsey & Oily, 2004).

The risk of having an MI may be mediated by migration, regardless of ethnicity. A study by Marmot and Same (1976) of 3089 Japanese people who migrated to the US divided the sample into three groups based on how far they had kept to their Japanese traditions. The difference between these groups cannot be explained by differences in dietary intake, serum cholesterol level, blood pressure or smoking. The study revealed that the most traditional group had a CHD rate that was as low as that observed in Japan. In contrast, the most Westernised group had up to three- to five-fold of CHD risk. The risk was almost as high as the people who were born in the US. They also found that among men of Japanese origin, the CHD mortality rate was highest in San Francisco, intermediate in Honolulu and lowest in Hiroshima and Nagasaki. This mortality rate was evaluated using death certificates (Syme *et al*., 1975; Worth, Kato, Rhoads, Kagan & Syme, 1975). Further, they examined levels of blood pressure and cholesterol in 11,900 men of Japanese origin in these areas. They found that San Francisco had the highest prevalence for both of these risk factors (Marmot *et al*., 1975).

Finally, the interaction effect of age and gender with ethnic has also been found. Higher incidence of CHD, not higher case mortality, resulted in out-of-hospital cardiac arrest was found among British South-Asians in Greater London (Shah, Bhopal, Gadd & Donohoe, 2010). The sample was based on data from London Ambulance Service during April 2003 to March 2007. However, only about

quarter of 3161 cases with ethnicity codes assigned which were included of the total sample of 13,013 cases. Shah *et al*., (2010) found more than two-thirds (63.1%) were British-Whites and 5.8 percent were British South-Asians. British-Whites sample tended to be older with an average of 69.5 compared with 64.6 among British South-Asians. Women tend to be older (73.6 years) on average seven years older than men (66.1 years).

Further discussion on risk factors in specific countries, the UK and in Indonesia, will be explored in the following chapter.

2.9 Current findings on risk factors of coronary heart disease

The identification of CHD risk factors has not resulted in the end of the battle against CHD as it continues to be the main cause of premature death globally. A recent study by Braunwald (2003) shows that 50% of people with CHD do not have most of the above mentioned major risk factors: diabetes, hypercholesterolemia, hypertension, smoking, obesity and physical inactivity. Instead, since the beginning of this millennium, there have been new findings on what causes CHD. Cardiovascular scientists follow the reductionist principle whereby they study smaller entities down to proteins and genes, as emerging factors.

Braunwald explains that oestrogen deficiency is a risk factor in post-menopausal women; homocysteine damages vascular endothelium *in vitro*, and high level of homocysteine is found in cigarette smokers; fibrinogen, factor VIII, PAI type I, tissue plasminogen activator and D-dimer all enhance thrombosis. Also, an increased level of lipoprotein(a) is an independent hereditary risk factor for CHD (Motulsky, 1992). Lipoprotein(a) is produced in the liver; high blood concentration is related to an increased risk of CHD (Timmis *et al*., 1997). C-

reactive protein is a marker of inflammation, and finally, *Chlamydia pneumoniae* may be involved in atherogenesis and plaque instability (Braunwald, 2003).

A recent study has identified risk and protective factors of CHD. The INTERHEART Study (Yusuf *et al*., 2004) was a global research study involving 52 countries which measured risk factors related to MI. They measured several risk factors in 15,152 patients with MI and 14,820 of non-MI cases as control group. The study identified six risk factors and three protective factors which can predict up to 90 percent of MIs. The main predictor was found to be raised levels of low density lipoprotein in the blood as a marker of raised cholesterol level; whereby people with this risk factor have a fourfold chance of developing an MI. Furthermore, smoking and diabetes could each increase the risk threefold; hypertension could add a two-and-a-half fold increase; and the presence of stress or central obesity appears to double the chance of MI. Consumption of fruit and vegetables, regular exercise and moderate alcohol intake, on the other hand, lower the chance of developing an MI. Altogether, the nine risk factors combined have almost 90 percent greater chance of developing to MI among men and 94 percent among women compared with those without any of the risk factors. This study also revealed that, overall men had an average of nine years earlier onset of MI compared with women. There is also a pattern found in the first onset of MI across regions. Asia and the Middle East had the youngest mean age of onset. In Asia, the mean age of first of MI is 51 years, and in the Middle East is 53. The highest mean age of 63 years, was found in Europe, China and Hong Kong (Yusuf *et al*., 2004).

Psychosocial factors also play important part in contributing to CHD. Kuper, Marmot and Hemingway (2005) conducted systematic reviews on research concentrating in psychosocial factors in aetiology and prognosis of CHD published prior to the year 2001. They limited their review to prospective cohort studies with a minimum of 500 participants. Psychosocial factors were included if

there were at least two eligible studies included details of the measurement used, and the outcomes were limited to fatal CHD, sudden cardiac death, non-fatal MI, angina, heart failure, and all-cause mortality for prognostic studies. Research focusing on stress was not included, since it was considered vague, but they included studies on depression, anxiety and distress. Studies that were included examined one of the following psychosocial risk factors: Type A behaviour pattern and hostility (18 prognostic and 30 aetiological studies), anxiety and distress (22 prognostic studies and 52 prognostic studies), psychosocial work characteristics (13 aetiological and 4 prognostic studies) and social support (9 aetiological and 21 prognostic studies). They found that Type A behaviour pattern and anxiety were not confirmed as risk factors, nor could hostility predict CHD. The review concluded that there is a relationship between depression, social support and psychosocial work characteristics with the aetiology and prognostics of CHD, whilst there are inconsistent findings for anxiety and Type A behaviour pattern.

2.10 Conclusion

CHD is a potentially fatal disease. It is also a financial burden to individuals and the government. Advanced research in CHD has improved the survival rate following MI. This also means that secondary prevention of MI is more important than ever before.

Currently, scientists and governments are trying to reduce risk factors, and hope eventually to be able to demonstrate a lower incidence of CHD. Without underestimating these emerging factors, which consist mostly of genetic predispositions to develop CHD, it is important to note that CHD is caused by what we choose to opt for as a 'lifestyle', rather than by what we are (Epstein, 2005). Epstein further argues that our choice of lifestyle leads to the higher risk factors compared with the background of genetic variation.

Many of the risk factors are more commonly found in some British ethnic minorities. These groups have been identified and targeted in an attempt to modify the risk of CHD. However, there has not been any research on illness beliefs, coping and HRQOL in these groups in the UK. The psychosocial factors implicated in CHD are particularly under researched in the East. Furthermore, no previous studies have attempted to compare cognitive and emotional aspects of health behaviour in the same sample.

Most of the risk factors that contribute to the development of CHD are related in some way to ethnicity. These factors are related not only to biological aspects of race, but most importantly, to behavioural and cognitive aspects. How people behave is influenced by culture. The following chapter analyses how culture shapes and regulates behaviour, and discusses some epidemiological studies that support the proposition that the risk factors of CHD are influenced by culture.

CHAPTER 3 CORONARY HEART DISEASE: A CULTURAL PERSPECTIVE

3.1 Introduction

As argued in the previous chapter, lifestyle plays a significant role in the course of CHD. Lifestyle is very much influenced by the society and environment in which people live. This makes it important to learn about the cultural background which influences people's health-related beliefs, behaviour, perceptions, emotions, diet, language, and religion as well as their attitudes to health and illness.

The observed major trends for CHD are reducing gaps between the West, where CHD has been declining, and the East, where it is on the increase. Additionally, in developed countries, there is substantial socio-economic inequality, where CHD is highest in the lower socio-economic groups (Marmot & Elliott, 2005).

This chapter begins with a definition of culture followed by an examination of how culture plays a role in the development of illness. It includes other influences which explain the patterns of CHD in the East and West. Terms such as 'developing' versus 'developed', 'industrialised' versus 'non-industrialised', and 'East' and 'West' used differently depending upon the sources. It is difficult to consistently use one term as they refer to different geographical areas and overlap with one another. For example, Japan, South Korea, Singapore, Taiwan and Hong Kong are developed countries situated in the East. East and West also do not clearly represent geographical locations; North America, Western Europe and Australia are considered to represent Western culture. Therefore, in this chapter, these terms are applied depending upon the source of the research.

This chapter explores the difference between different terms used in referring to culture, the relationship between culture, health and illness, and the epidemiology of CHD.

3.2 'Race', 'ethnicity' and culture

There is a difference between culture, ethnicity and race. As a member of a cultural group, each person also has their own culture and sense of cultural identity. This is termed ethnicity, as opposed to the term 'race' which specifically refers only to biological characteristics (Senior & Viveash, 1998).

The concept of culture is used widely, mostly in social sciences, but there is still no single accepted definition of culture (Johnson, 1996). Helman (2007) defines culture broadly as:

> "...a set of guidelines (both explicit and implicit) that individuals inherit as members of a particular society, and tell them how to view the world, how to experience it emotionally, and how to behave in it in relation to other people, to supernatural forces or gods, and to the natural environment." (p.2)

Mazrui (1986) gave a more specific definition of culture that is more applicable to this research. He defines it as:

> "...interrelated values active enough to influence and condition perception, judgment, communication, and behaviour in a given society." (p.239)

Cultures are not constant. When faced with new situations and pressures, people within a particular culture will adapt to these (Henley & Schott, 1999). Cultures contain aspects that are visible, such as language, clothes, art and architecture, and invisible, such as shared norms and values (Henley & Schott, 1999). There are

other influences on how a person behaves apart from culture, such as social, economic and physical environments.

This contrasts with the concept of ethnicity, which is defined by Clark (1992) as:

> "…the designation by self or others as a member of a distinct population group on the base of specific national and/or biological characteristics." (p.282)

Clark (1992) further explains that in a particular ethnic group, the members may not necessarily share some elements of a common culture; ethnicity refers to a group of people which is different from another group. Ethnic groups share cultural features along with histories, migration, political and economic processes that separate them from the other groups (Guarnaccia, 1996).

Hillier and Kelleher (1996) argue that the merging of several ethnic groups would not simply make a culture; neither would similar ethnic origin create a uniformity of culture. Therefore, ethnicity may or may not correspond to a certain culture. They also point out that outsiders can define a particular culture and identification of cultural difference, which may influence how a cultural group identify themselves.

Culture may influence ethnic distinctions, but it is different from ethnicity (Clark, 1992). Even so, culture is largely 'invisible' to its members. There are subcultures in every culture, which are smaller groups of people within a large culture who share certain characteristics not shared by the culture at large (Haas, Leonard & Galanti, 2004). The means by which by individuals learn and internalise their culture is through a process of enculturation. The 'Enculturation' process takes place when someone grows up in any society and this includes joining and learning the patterns in particular subcultures; and, in contrast, 'acculturation' refers to a process of adopting a new culture (Haas *et al*., 2004).

Culture influences health, as it influences thoughts and actions specific to a particular society or sub-group (Airhihenbuwa, 1995). These influence how a person views the causes of illness and suitability of treatments, when to seek treatment and whom to consult (Henley & Schott, 1999). Furthermore, cultural background also influences illness beliefs. Henley and Schott (1999) identified that culture is expressed in body functions; what is perceived as normal and healthy; causes of illness and what illness represents; the order of importance of physical symptoms; psychological or emotional symptoms as a result of an illness; illness responses and expectations by the individual and others, and diagnosis and treatment of an illness. In addition, Helman (2007) identified other factors such as: behaviour, perceptions, emotions, language, religion, rituals, family structure, diet, dress, body image, concepts of space and time, and attitudes to illness, pain and other form of misfortune.

Culture is not limited by borders or nationality, but is linked by common languages, traditional heritages, and socio-political experiences can share similar representations of illnesses. Latino cultures for example, share a common language among Latin Americans, and in the Caribbean. They have similar beliefs about the hot/cold theory of disease to explain causes of disease and treatment in maintaining 'balance' (Bauman, 2003). Culture also tells its members about dietary intake, which influences their nutritional status, and each culture has its own particular favoured illnesses, i.e. those which are considered important and those which will be overlooked (Clark, 1992).

How a person relates to a particular culture is related to their self-concept. Baumeister (1986) defined identity as an interpretation or a definition of the self. He further suggested that aspects of identity include self-knowledge, self-actualisation and individuals' relation to their society. According to Baumeister, identity in the modern world is influenced by both religion and society. Society lays out certain ambitions and goals for its members, how to think and act.

Society not only influences the identity of its members, but also vice versa, i.e. an identity of each member of society influences the others. More discussion on religion will follow shortly in this chapter.

There are points to remember in attempting to understand a certain culture (Clark, 1992): (1) cultural practices originate as a response to an environment, (2) there is a meaning behind behaviours, and (3) not all members of a cultural group will behave according to all of the typical cultural behaviours.

There is often a misconception about the study of culture in the health context. Stubbs (1994) argued that there is a distorted view as 'race' is often seen as a 'fact', instead of variable which is not contextualised in any sense. Further, he argues that this separation of 'race' and 'health' encourages the ignoring of the fact that 'race' is a socially constructed category, and not simply biological in essence. This may be true in the case of CHD where some of the factors that contribute are lifestyle choices, for example exercise and diet. Ahmad (1996) also supported this view; as he argued that research in relation to culture and health simply conclude that minority communities are a threat to their own health. It is important to save them from their own cultures, which includes their minds, their beliefs and their behaviour, thereby 'blaming the victim'. This is because common (mis)conceptions of 'culture' in past research on the health and health care of minority ethnic communities lacked recognition of the dynamic and contextual nature of 'culture' itself. Ahmad (1996) viewed the use of categories for exploring the difference between culture and ethnicity as anti-racist. He further argued that cultural groups are characterised by diversity rather than uniformity, with culture acting as both broad and flexible boundaries for beliefs and actions (Ahmad, 1996). He explained that research on culture and health has focused on the notion of minority cultures instead of the wider context of people's lives because cultural norms and behaviour sometimes interlink with other factors, such as poverty, gender relations and racism. Ethnic minorities become defined as

the product of racism. This results in both the failure of research on 'race' and health to explain differences in health experience and the failure to improve provision to minority ethnic groups. Kelleher (1996) also shares this view. He agreed that there is a problem with defining the boundaries of ethnic groups when deciding who is and who is not a member of a particular group. An example is the case of second generation of immigrants who are usually subject to acculturation; or the appropriateness of categorisation such as 'Asian', which describes a non-heterogenous group. Kelleher stated that ethnic labels used by outsiders may be inaccurate indications of what the labelled people share. He pointed out that categorising people in their ethnic group will not provide a thorough explanation of their behaviour, but instead gives a certain label of how they are responding to illness and use this as contributing factors to their health. Hillier and Kelleher (1996) concluded that there is no support for 'blaming' cultures and ethnic groups for producing ill health. Instead, whether studying major or minority culture, people's meanings and needs can be better understood by listening to what they say about their own health.

3.3 The context of culture in relation to health and illness

Culture shapes how individuals perceive themselves and their surroundings. For example, each culture may hold a different meaning to different body parts. In traditional Chinese medicine systems, the heart has been related to insomnia, dreams, delirium, forgetfulness, and insanity (Jackson, 1988).

Medical anthropologists have long been interested in health and illness in the context of culture. Kleinman (1981) studied Chinese and Taiwanese patients and healers. He concluded that illness is created by personal, social, and cultural reactions to disease. Illness is the response to disease. Culturally unique patterns can contribute their own meaning to the disease for the people who live in that

culture. This results in the patterning of symptoms, which may produce culture-bound disorders. For example, HIV may be viewed as a curse disease, the result of a person's act in the past which is unacceptable to the culture. Hence, he concludes that culture affects the illness sufferers and the culture-bound disorders through the construction of illness categories and experiences. This simply means that culture plays a role in the individual's experience and expression of symptoms (Good & Good, 1981), since in every culture there are norms which serve as guidelines for how people should behave when they are ill (Lewis, 1981).

Perception of disease may or may not be determined by cultural beliefs, social setting, and personal experience (Kleinman, 1981). Personal experience comes when an individual perceives the world selectively and gives it meaning by relating these perceptions to their past experiences (Lewis, 1981). These cultural beliefs, social settings, and personal experiences are essential elements in interpreting disease and thereby affect the disease throughout the illness (Kleinman, 1981). Individuals around the world may have a similar basic biological nature, but differ greatly in regard to their social arrangements, ideas, and values. Classifying illnesses according to the social attributes of the people affected or by social effects of the illness could be important (Lewis, 1981).

Illness behaviour is related to how someone perceives and interprets their ill-experience and, as explained further in the next chapter, includes the perception, affective response, cognisance, rationalisation, evaluation of the symptoms of disease, and communication (Kleinman, 1981). All of these symptoms are moulded by the illness experience (Kleinman, 1981). Illness behaviour, therefore, is a response to illness perception. Lewis (1981) states that the individual perception of illness may differ from the perception of the health professional. The health professional has learnt in depth about diagnosing and treating the illness, which the patient has not. The name used by the individual and health professionals for a particular sort of illness or symptom may refer to the same

thing, yet give it different significance (Lewis, 1981). Kleinman (1981) argues that each individual has a different understanding and acceptance of social norms and how far they follow those norms in actual practice. These affect the way the individual thinks about and reacts to sickness. He adds that responses to their illness are influenced by their beliefs about their sickness, the treatment they expect to undergo, and the type and the degree of support received from their family and their doctors. Therefore, each individual has their own unique representations of illness, which may have been influenced by the past experiences, despite the information they receive from their doctors.

Individualist cultures, largely those of Western society including Europeans, Australians and North Americans, emphasise the importance of the biomedical model of disease and illness, and mind-body duality. In contrast, collectivist cultures have few distinctions between mind-body, religious, medical, spiritual, emotional and social processes (Bauman, 2003). Airhihenbuwa (1995) suggests that traditional healing comes from a philosophy that there is a need for balance within the individual and between the individual and the environment. Helman (2007) terms this as individual body-self which represents the physical and psychological; and social body which functions to live within a particular society.

Regardless of borders, CHD prevalence is rising and it has become a true pandemic (Mackay & Mensah, 2004). Cultural background has an important influence. The institutions of society can influence prevalence, both directly and indirectly, as well as subtly and self-evidently (Townsend & Davidson, 1992).

However, Helman (2007) points out other influences on health-related beliefs and behaviours which contribute to the risk factors as explained in Chapter 1. These influences are: (1) individual factors, such as age, gender, size, appearance, personality, physical and emotional state, (2) educational factors, including both formal and informal education, (3) socio-economic factors, such as social class,

economic status, occupation or unemployment, and the networks of social support from other people, and (4) environmental factors, such as population density, public transport, health facilities.

3.3.1 *Religion and spirituality in health behaviour*

> "Religion is one of the main aspects of life by which we define ourselves, and from which we derive our sense of community. In the 2001 UK Census, 76.8% of people said that they had a religious faith. Religions embody the spiritual commitments and guiding principles that govern the lives of many people."
>
> From 'Sacred' exhibition guide in British Library, 2007

In many parts of the world, religion and spirituality have a dominant role in governing people's lives, and intertwine with other aspects of culture to create an identity. Research into and definition of diseases mostly arises from the West. There, illness is treated more as an external intervention and self-determined life course. In different cultures, illness may be determined by external factors such as karma, fatalism, and cultural pre-determinism (Schipper, Clinch, & Olweny, 1996). Nichter (1996) explains that in the South Indian Hindu culture, health and prosperity are granted upon the household, family, and kingdom, for following the order by ancestors, gods, and patron spirits. Tradition is embodied through medicine consumption. Medicine makes an important contribution to the role of identity. Health is a result of stamina as well as physical environment, work, diet, lifestyle, as well as being influenced by the rotation of planets, spirits, and winds. Jackson *et al*. (2000) conclude the concepts of pain and illness within a particular culture may be seen as purely physical, spiritual, a result for guilt, or possession by demons; they reflect a cultural concept. Illness and pain in one culture may be preserved, and in another culture avoided. Airhihenbuwa (1995) suggests that religion, along with shared cultural values and beliefs, is a necessary ingredient for preventive and curative health practices in traditional healing. Religion is

important for understanding the spiritual dimension of health. The latter plays a part in the maintenance of the psychosocial dimension of health. He concludes that health care is more important than medical care because health care systems consist of a set of resources that may serve both medical and non-medical goals.

Religion may shape behaviour as Lambert and Sevak (1996) argue that there is more similarity between religious groups, regardless of the religions, compared with less religious persons of the same ethnicity or religion. For example, Williams (1993) conducted a study relating religion to illness across ethnic groups and religions in Scotland. She found that Protestant believers were the least likely to attach little or no personal importance to their religion, whereas, generally, Catholic believers and those from South Asia attached the strongest collective importance to their religion. Those who believe in metaphysical forces within a health context may utilise the power of prayer and supernatural forces. On some occasions, stories about miracles are generated as answers to prayers or faith in unlikely conditions. This is regarded not only at the individual level, but also in the communal efforts of family, friends, or church fellowships surrounding the individual, as well as interventions from God (Williams, 1993).

Another concept related to religion is spiritual well-being. Moberg (1979) considered beliefs to be beyond religion, but rather a concept of spiritual well-being. He defined spiritual well-being as:

> "... pertains to the wellness or 'health' of the totality of the inner resources of people, the ultimate concerns around which all other values are focused, the central philosophy of life that guides conduct, and the meaning-giving centre of human life which influences all individual and social behaviour." (p.2)

Spiritual concepts are directed towards not only those who are religious, but also non-religious and anti-religious people. As a result, the concept of "God" can

have a broader definition, from the traditional views, to one's focal point in life, such as work or family (Ellerhorst-Ryan, 1996). As a concept, spiritual needs may take form in hope, meaning and purpose of life, forgiveness and love and relatedness. Meeting spiritual needs is the goal of most religions (Moberg, 1984), and using spirituality as a coping strategy (discussed further in the next chapter) may also be an important aspect in viewing health care as a whole (Ellerhorst-Ryan, 1996). In Eastern cultures, illness manifests not only physically but also psychologically, socially, and at a spiritual level (Bauman, 2003).

3.3.2 *First- and second-generation immigrants*

First-generation immigrants are those who were born outside and migrate to settle down in another country many years ago; and second-generations are the children of the first-generation immigrants (Abourguendia & Noels, 2001). The historical background of the UK immigrants is explained in the section 3.5.1

Abourguendia and Noels (2001) reported that there are differences between seventy-four first- and second-generation immigrants. In the study of Canadian immigrants, first-generation immigrants were more fluent of their native language whereas the second-generation were more fluent in English. The Canadian first-generation immigrants in this study had more contact with relatives in their country of origin, whereas the second-generation had more contact with the outgroup members. Acculturation-related daily hassles in this study were defined as *assimilation* where original cultural identity is considered unimportant and interaction with outgroup members is valued. In contrast *separation* emphasised original cultural identity and avoiding interaction with the outgroup, *integration* referred to valuing both the original cultural identity and the other culture, and *marginalization* is where there is lack of interest in both. Daily hassles were measured as *general*, *family*, *ingroup*, and *outgroup factors*. Abouguendia and Noels (2001) found that for the first-generation, *assimilation* was related to

increased family hassles, *separation* was related to increased ingroup hassles, and integration was related to both less family and ingroup hassles. In the first generation immigrants, ingroup hassles predicted more depression, whereas in the second-generation immigrants it predicted lower self-esteem. In addition, depression was predicted by the second generation immigrants perceived outgroup hassles. Ingroup hassles were more salient among the second-generation than the first-generation and the second-generation also reported lower self-esteem than the first-generation. In general, second-generation experience more psychological distress compared with the first-generation immigrants.

As an example, Lambert and Sevak (1997) conducted their study on first-generation British-Bangladeshi, British-Pakistani and British-Indian groups. More 'traditional' understandings of the nature of health and influences upon it, such as humoral theories found in Ayurveda, were predominantly found in first-generation immigrants rather than among the second-generation British-born. Further explanations of this study can be found in the following section.

In another study, first-generation Swedish immigrants with older age at migration reported poor self-rated health compared with those who migrated before they were seven years old (Leão, Sundquist, Johansson, & Sundquist, 2009). However, this study included varied types of immigrants including Finnish-born individuals and refugees. Among the second-generation, immigrants in this study were commonly found to be married to a Swedish-born individual.

3.4 Cultural factors in the epidemiology of coronary heart disease

Helman (2007) listed several cultural factors in relation to disease. These factors can be causal factors, contributory, or they can be protective. Some of the cultural factors are related to the epidemiology of CHD are: economic situation, gender

roles, religious rituals, culturogenic stress, use of 'chemical comforters', diet, use of alternative therapies and pain threshold. Culture is influenced by the external environment, as well as by its own members. The external environment includes the economic situation of a particular region or country that may contribute to the incidence of CHD. In the UK, for example, CHD is more common among groups with lower income.

The behaviour and rules set by its members, shape culture. Roles assigned for each gender are typical to its culture. This cultural stigmatisation of a particular behaviour to a specific gender can either be protective, such as in many Eastern countries smoking is considered to be inappropriate behaviour among females. The religious rituals performed by the members of a specific culture also contribute to the culture. Some religions forbid a particular food, for example Islam and Judaism forbid the consumption of pork, and Hinduism and Buddhism promote a vegetarian lifestyle, which helps to decrease the risk of CHD.

Another factor is culturogenic stress. Culturogenic stress is: "…certain cultural beliefs, values, expectations and practices that are more likely to increase stress" (Helman, 2007; p. 294). He points out that culturogenic stress can be induced or sustained depending on the culture's values, goals, norms, taboos, or expectations. CHD incidence varies depending upon the degree of acceptance of 'workaholism' in certain cultures, which is associated with job strain and an ingredient of the Type A behaviour pattern - discussed in Chapter Two. This stress also relates to the use of 'chemical comforters, such as smoking or tobacco chewing, which in some cultures is encouraged among males.

An important cultural factor in relation to CHD is diet. Helman (2007) points out that when vegetarianism is more common, CHD is lower than in areas where eating meat is more encouraged. Also, the use of certain ingredients, such as high

salt, fatty foods, or how food is prepared, for example frying, can influence the risk of CHD.

Treatment adherence may also relate to a cultural factor where, following an illness, people may try to find alternative therapies in the form of self-treatment strategies and lay therapies, instead of seeking medical help. In some cultures, the first symptoms of heart attack can be interpreted as a particular folk disease and be treated by folk healers with herbal remedies or other tradition-related treatments (Helman, 2007). Misinterpretation of symptoms can be fatal when treatment seeking is delayed. Explained in the previous chapter it is crucial to receive medical treatment within the first six hours following a heart attack.

Finally, pain threshold also plays a part as a cultural factor. Helman (2007) explains that social, cultural and psychological factors can influence the perception and tolerance of pain. Further, culture and social group also determine pain expression in public. In cultures where pain tolerance is high and there is a low tolerance of public pain, a person experiencing a heart attack may ignore the first symptoms of chest pain instead of seeking medical treatment.

An example of how health behaviour is influenced by culture and beliefs is provided by a study commissioned by the Health Education Authority in the UK (Nazroo, 1997). Nazroo found that alcohol consumption was more common in some minority ethnic groups, and hardly consumed at all in others. British African-Caribbean and British-Chinese people were more likely to consume alcohol, compared with almost none among British-Muslims in the British-Pakistani and British-Bangladeshi groups. Nearly all of the British-Whites in this study drank alcohol where as many as, 90% of men and 80% of women reported consuming alcohol. The alcohol consumption is lower among other minority ethnic groups. Three-fifths of the British-Indian and British African-Indian groups drank alcohol and the least were among British South-Asian groups where only a

quarter drank alcohol. Most participants in the Beshion and Nazroo (1997) study were aware that excessive alcohol consumption is linked to heart disease. Religious and family expectations were the main reason for not drinking among British South-Asians, compared with cost or legal restrictions among British-Whites.

In another study, Lambert and Sevak (1996) conducted a qualitative study of first-generation immigrants with no previous history of CHD among the British South-Asian population in Camden, Southall and Wembley. The aim of the study was to explore the perceptions of health and the sources of ill health. These areas were specifically targeted because Camden is where many people of British-Bangladeshi origin lived, Southall to target British-Punjabi people and Wembley to target people of British-Gujarati origin. Participants were targeted through GPs and through a random 'walk around' method in the London Borough of Camden. The study focused on the prevention of CHD among these groups and on discovering the existing perceptions of causes and prevention of CHD. They interviewed 32 men and women aged between 35 and 64 who were mostly first-generation immigrants from November 1991 to April 1992. For this British South-Asian group, the first part of the study was aimed to find possible intervention for preventing CHD. They found that weight loss and the promotion of exercise are the most important areas to target. They also found that men tended to consider illness in *persona* terms, while women tended to feel responsible for their own health and for the health of her family.

In this qualitative study, Lambert and Sevak (1996) compared within sub-culture differences in these British South Asian groups. Overall, they found there were more similarities than differences across these three groups. The groups had linked perceptions about health and the causes of ill health. Lambert and Sevak also compared these sub-cultures in the UK with those living in South Asia. They found similarities in perceptions about health in relation to climate, appropriate

balanced foodstuffs and activity pattern across geographical origins, language and religion. These perceptions about causes of CHD were characterised by a common sense interpretation of illness rather than of either disease-specific or culture-specific beliefs. The British South-Asian communities in this study believed that stress, heredity and lifestyle, such as smoking, alcohol drinking and unhealthy food were the causes of CHD. Lambert and Sevak (1996) explained that the similarities among the British-Whites and the British South-Asians regarding the causes of CHD are as a result of similar exposure to health education messages which are well known among lay people from a variety of backgrounds. Finally, they also concluded that socio-economic status, education, gender and age are more important features in perceptions of health and responses to health information, rather than simply ethnicity. This study adopted a sociological and anthropological approach which:

> "…mainly intended to give information for the planning and provision of appropriate and effective services." (p.125).

Although this study focused on the cross-cultural differences among British minority ethnic groups and British-Whites, it focused on exploring the causes of CHD, not responses to the impact of having a heart attack. In addition, this study also used qualitative methods among a relatively small sample of thirty-two healthy participants. The random 'walk around' method to gather the British-Bangladeshi sample in Camden is also questionable in terms of sampling biased: there were six older people compared with only one person in the age classification of 35 to 44 years. The study took place during the day when younger people tend to be working. The method of sampling also provided no control of socio-demographic variables. Finally, this study focused on people with no previous heart disease. As mentioned by Kleinman (1981) (see section 3.3), having a personal experience could have a different effect on perceptions of an illness, and is likely to be different from the perceptions of healthy people.

The causes of ill health were also studied in a study of 149 college students. Landrine and Klonoff (1994) studied cultural diversity in causal attributions for general illness, in particular, supernatural causes. Their study included 70 ethnic groups including Black-Americans, Latin-Americans, Asian/Pacific-Americans, which they grouped as 'coloured' and sixty White-Americans. In their first questionnaire, they were asked to elicit what causes people to get sick. They were then asked to rate the importance between 1 (not at all) to 7 (extremely). In the second questionnaire, the participants were presented with 37 possible causes of ill health which included supernatural, interpersonal, intrapersonal, and natural causes, and similarly, participants were asked to rate the importance of each possible cause. They found that White-Americans and ethnic minorities did not differ in the number or type (natural vs supernatural) they elicited and rated in the first test. However, when presented with list of causes, ethnic minorities were more likely to place high importance on supernatural causes compared with the White-Americans. They also found that there are differences between different ethnic minorities, which may have been due to differences in acculturation.

3.4.1 *General characteristics of UK people*

Data from the WHO (2008a) report shows that the UK has a population of around 60 million and a growth rate of 0.3 percent. Based on the Office for the National Statistics (2004), of the total population, 92 percent are British-Whites. Of the ethnic minorities, British-Indians constitute the largest proportion, consisting of 1.8 percent of the total UK population, followed by British-Pakistani people with 1.3 percent. The size of the UK is around 244,110 square kilometres. This country is one of the highest income countries in the world, with GDP of around £20,000 (WHO, 2008b). British-males' life expectancy is 77 years of age and 81 years for females (WHO, 2008b).

Madhok *et al.* (1992) explain the background behind migration of the British ethnic minority people. During the 1930s and 1940s, a small group of men arrived in the UK as sailors and cooks on navy ships. Later their families joined them. There was also another group of professionals and students who came to the UK during this period. After the Second World War, more people came to the UK to work in industrial sectors when there were labour shortages. After some time, they usually decided to bring their families, and sometimes their parents, to join them.

In relation to the health and lifestyle of these ethnic minorities, the following study was based on the Second Health Survey on Ethnic Minorities (Johnson, Owen, & Blackburn, 2000), and included 4452 respondents (72% of valid screened addresses) which were evenly divided among 1173 British-Bangladeshis, 1145 British-Pakistanis, 1071 British African-Caribbean people, and 1063 of combined British-Indian and British African-Asians. Many participants of British African-Caribbean descent were older and, along with the Indian population, were likely to refuse to take part in this study. The respondents' age was between 16 to 74 years of age. The British-Pakistani and British-Bangladeshi respondents had the largest household size, while British African-Caribbean respondents had the lowest. Most of British-Pakistani and British-Bangladeshi respondents were Muslims, British-Indian respondents were divided among Hindis (40%), Sikhs (30%) and Muslims (20%). British African-Caribbean respondents were mostly Protestant or Catholic. Nearly all of the British South-Asian respondents reported having a religion, compared with only 75% of the British African-Caribbean males and 10% of the females.

The unemployment rate in ethnic minorities was high as revealed in this Second Health Survey in England. The British-Bangladeshi respondents were the most disadvantaged. British-Indian men were more likely to be working and had better occupations than the others, while British-Bangladeshi women followed by

British-Pakistani women were at the other end. Unemployment rates for women were generally lower than for men. They mostly had a caring role as wives or mothers or carers for family members. Women from these minority ethnic groups came to the UK after their husbands settled in or following arranged marriages. They are more likely not to be able to speak English and therefore, were least likely to work. About two-thirds of British-Pakistani and British-Bangladeshi men over 50 years old were unemployed. This is consistent with the previous finding that unemployment among British-Pakistani and British-Bangladeshi men is very high compared with their British-Indian counterparts (Henley & Schott, 1999). This can be explained by the fact that the British-Indian respondents were more likely to have educational qualifications than the others, and British-Bangladeshi respondents were the least likely. British-Indian men were generally more likely to work in professional occupations, as managers or administrators compared with British African-Caribbean men. Most of British-Pakistani and British-Bangladeshi women across different age groups reported having never worked. The long-term unemployment rate was highest in British-Pakistani men.

Social class varies between the British ethnic minorities, as found in this survey. A very small proportion of the ethnic minorities are in the professional class, with British-Indian men being the best represented in this category compared with the other groups. The skilled manual class had the largest membership of men across all four minority ethnic groups. As the lowest income earners, more than half of British-Bangladeshi respondents reported receiving income support, compared with only a quarter of British-Indian people.

Regarding property ownership, in this survey, British-Indian and British-Pakistani respondents owned more houses than the rest of the groups. British-Bangladeshi respondents were more likely to live in rented social housing. Car ownership also showed a similar result with British-Indian respondents having the highest and British-Bangladeshi respondents having the lowest rates of ownership.

This Second Health Survey found that generally, males in the minority ethnic groups were more likely to speak English compared with their female counterparts. The ability to speak English was high among the British-Indian, British-Pakistani and British-Bangladeshi male respondents and lowest among older Bangladeshi females. However, the ability to read was rather low across all groups. Sixty percent of British-Indian men reported being able to read and speak English very well, compared with 50% of the British-Pakistani women, 40% of the British-Pakistani men and British-Bangladeshi women, and 30% of British-Bangladeshi men.

Most of the respondents were born outside the UK. About 90% of the British-Bangladeshi respondents and about half of the British African-Caribbean respondents were not born in the UK, compared with around three-quarters of British-Indian and British-Pakistani respondents. At the time of the survey, British South-Asian respondents who were not born in the UK, mostly arrived during young adulthood. British-Bangladeshi women arrived at a much later age than any of the ethnic minorities when they decided to follow their husbands to the UK.

In terms of educational qualifications, this survey found that British-Indian men and women had the highest qualifications. British-Indian men were the highest with around 12% having educational qualifications and 8% in women. British-Pakistani men and the British African-Caribbean population were the lowest. Only 4% of the British African-Caribbean men and 5% of British African-Caribbean women had educational qualifications, followed 8% of British-Pakistani men. British-Bangladeshi people are the most disadvantaged with regard to education.

Mortality as a result of CHD is high among the British ethnic minorities. British-Indian, British-Bangladeshi, British-Pakistani, and British Sri-Lankan populations have a higher premature mortality rate than the UK average using the 1971 and

1991 census figures (Wild & McKeigue, 1997). They found that the rate was 46% higher among men and 51% among women compared with the general population. The difference between the British South-Asian group and the UK average is higher because the mortality rate from CHD is not decreasing as fast in this group compared to the rest of the population. This report also shows that the decreasing rate is also slower in the minority ethnic groups than average. From 1970 to 1992, the mortality rate of the minority ethnic groups fell by 20% for men and 7% for women, compared with 29% of men and 17% of women in the general population. Timmis *et al*. (1997) explain that this is suspected to be the result of genetically determined insulin resistance syndrome, which is reflected in central obesity, hyperinsulinaemia, hypertrigliceridaemia, reduced plasma high-density lipoprotein cholesterol, and hypertension, with or without non-insulin dependent diabetes.

In relation to the prevalence of different risk factors, findings published were in the Health Survey for England: The Health of Ethnic Minorities (Department of Health, 2005), based on 2004 data, which used the general guideline of a systolic blood pressure of 140mmHg or over, or a diastolic blood pressure of 90 mmHg or over, or were being treated for hypertension. This reported that the prevalence of hypertension among both British African-Caribbean men (38%) and women (32%) is above the general population men (32%) and women (29%). On the contrary, the British South-Asian groups, in general, scored lower than these general figures. In the same report, British-Bangladeshi men (16%) were found to have the lowest rate with only half of the general population. British-Bangladeshi women (19%), British-Pakistani men (20%), British-Pakistani women (15%) and British Indian women (18%) also have a lower than average rate. British-Indian men (33%) have the highest rate of hypertension among the British South-Asian groups.

Diabetes was also a common problem not only among British African-Caribbean groups, as mentioned above, but also even higher among the British South-Asian

groups (Nazroo, 1997). All minority ethnic groups reported higher rates of diabetes compared with the British-Whites (Nazroo, 1997). However, the prevalence in the British-Pakistani/Bangladeshi group was three times higher compared with the British-Whites (Nazroo, 1997). The Health Survey for England: The Health of the Ethnic Minorities (Department of Health, 2004) revealed a similar picture. The diabetes prevalence of the British African-Caribbean males (10.0%), British-Indian males (10.1%) and British-Bangladeshi males (8.2%) were double the prevalence of the general British male population (4.3%). Among females, British African-Caribbean (8.4%) and British-Pakistani (8.6%) were the two and a half times that of the general female population (4.2%).

Another risk factor, smoking, is particularly high among men across all British ethnic minorities (Beshion & Nazroo, 1997). In this study British African-Caribbean people tended to smoke most, followed by British-Bangladeshi and British-Chinese people. Across all groups, men were more likely to smoke than women and the prevalence was especially low among the British South-Asian group. Beshion and Nazroo report that all participants in their study were aware of the danger of smoking. These findings are consistent with those of later studies, for example, the Second Health Survey on Ethnic Minorities by Johnson *et al*. (2000). Beshion and Nazroo found that smoking prevalence was lower or the same across all of the minority ethnic groups compared with the rest of the British population. Based on a WHO (2008a) report, 27% of British-men and 25% of British-women smoke, which is low compared with other Western European countries. Compared with the general population, smoking was also more prevalent among males than females. British-Bangladeshi men had the highest smoking rate (49%), followed by British African-Caribbean men (29%), British-Pakistani men (25%) and British-Indian men (15%), in contrast to the Indian male smokers who resided in India in which more than half of the male population smoke (57%) (WHO, 2008a). A similar trend was also observed among the

women in these ethnic groups: British African-Caribbean (21%), British-Bangladeshi (6%), British-Indian (2%) and British-Pakistani (1%). There were some exceptions among the oldest group of British-Bangladeshi women aged 50 to 74 (14%), and very high among British-Bangladeshi men aged 30 to 49 (54%) and 50 to 74 (70%). Daily cigarette consumption across all the minority ethnic groups was lower than the general smoking population in the UK, except among British-Bangladeshi men (17 cigarettes per day). British African-Caribbean, British-Pakistani and British-Indian men were similarly low (12 cigarettes per day). In females, British-Indians smoked an average of 11 cigarettes and British-Pakistanis 12 cigarettes per day. British African-Caribbean women and British-Bangladeshi women consumed cigarettes at nearly the same rate of 10 cigarettes per day. Furthermore, Johnson *et al*. (2000) also found that chewing tobacco was common in British South-Asian respondents, particularly among British-Bangladeshi respondents, and less among British-Indian and British-Pakistani respondents. British-Bangladeshi women over the age of 30 had the highest tobacco consumption (80%). More than a third of British-Bangladeshi men reported chewing tobacco and smoking cigarettes. From another report, among the British ethnic minorities, British-Bangladeshi men (40%) followed by British-Pakistani men (29%) have a higher rate than the general male population (24%) (Department of Health, 2005). From the WHO report (2008a), the prevalence of smokers among British-Pakistani males is slightly lower than men living in Pakistan (32.4%) in contrast to that of Pakistani-women (4.4%). In total, Pakistani-smokers make up of 19% of their total population (WHO, 2008a). Health Survey for England 2004 on The Health of Ethnic Minorities also revealed that 23% of women in the general population smoke cigarettes, and the highest were British African-Caribbean group (24%). British South-Asian female groups were at 5% rate or less.

The obesity level in the UK is relatively high (Nazroo, 1997). Overall, 43% of men and 32% of women in England based on the survey in 2006, are overweight. Furthermore, in this 2006 data, obesity was found in 24% of men and women (BMI over 30kg/m^2) and central obesity was found in 32% of men and 41% of women. These data also revealed that the prevalence of obese males and females was highest between the 35 to 74 years of age group. Obesity has been on the increase between the years 1994 and 2006. Obese men between 16 to 64 years group increased from 14% in the 1994 to 25% in this latest survey, while women increased from 19% to 29%. Obesity was also common among the ethnic minorities. British African-Caribbean people reported the highest level of obesity, followed by a similar rate from British-Indian, British African-Asian and British-Pakistani people (Nazroo, 1997).

Obesity is related to diet. The BHF report (Allender *et al*., 2008) revealed diet among the ethnic minorities in the UK as a variable. They reported that British-Bangladeshi population is more likely to consume red meat and fried food compared with the other groups. The British-Indian population is the least likely to frequently consume red meat and British-Indian men are the least likely to eat fried foods. British-Bangladeshi adults consume the least fruit and British-Pakistani adults consume the least vegetables. There was a higher rate of understanding the key terms used in healthy eating, such as 'starchy food', 'fat', 'dietary fibre', among British African-Caribbean respondents, compared with the British South-Asian groups. Of those who reported understanding these terms, knowledge of foods high in starch, dietary fibre, fat and saturated fat was poor. There was a low knowledge of the link between diet and cardiovascular diseases across all of the groups, particularly among British-Bangladeshi people.

A Westernised lifestyle has introduced CHD to many Asian countries, mainly through adverse diet. Westernised food that is high in fat, commonly found in fast food chains, have shifted this trend. Higher fat intake has resulted in lower

carbohydrate consumption, and energy is derived from dense foods that are low in dietary fibre. Animal fat has also become more available and more affordable, thus increasing consumption. This has replaced the traditional diets which consist of pulses as the major source of protein and vegetarianism, which is commonly found among Indian people. However, most respondents in the Beshion and Nazroo (1997) study were concerned about the effect of diet upon health. Fat, salt and sugar were the most often mentioned substances, but hidden fats in processed foods, dairy products and the distinction between saturated and non-saturated fats were rarely mentioned. Non-British born participants were more likely to eat traditional foods, while those born in the UK tended to eat a mix of traditional and western food. Most British-Indians and British-African Indians' diet consisted of predominantly vegetarian dishes.

Another contribution to obesity is sedentary lifestyle. In the Health Survey for England (Department of Health, 2008) survey in the year 2006, about 53% of male and 33% of female adults between the ages of 16 to 24 years old in England were reportedly active. In this survey, ethnic minorities, particularly British-Pakistani, British-Indian and British-Bangladeshi populations in the UK, were generally less physically active than the general population. Among these minority ethnic groups in the UK, British-Bangladeshi people were found to have the lowest level with 26% of men and 11% of women exercising to the recommended level. In contrast, British-African men (35%) and British African-Caribbean women (31%) were the most physically active.

Regarding physical activity, many of the participants believed physical activity to be important. Younger and better educated participants were more likely to exercise compared with the older ones (Beshion & Nazroo, 1997). In addition, Johnson *et al*. (2000) found that, although all of the minority ethnic groups were aware of the importance of exercise to maintain health, few respondents were following this in practice, particularly British-Bangladeshi men and women, and

British-Pakistani women. There was a low level of knowledge of the recommended level of physical activity, which could explain this pattern. Among those who reported exercising, walking was the most common mode. Caring for children and people with disabilities were also significant ways of being physically active.

3.4.2 *General characteristics of Indonesian people*

Indonesia is the fifth most populated country in the world with nearly 240 million people, nearly four times the UK population, and a growth rate of 1.3%. The size of Indonesia is around 1.9 km^2, the fourth-largest Asian country and it has more than 13,000 islands. Although it is the biggest Muslim country in the world with around 90% of the population Islamic believers, the country is run by a secular law. Indonesia is a middle income country with gross national income per capita of around £1250 (WHO, 2008b). Life expectancy at birth is 70 years (WHO, 2008b)

Indonesia has been growing rapidly since 1985. Industrialisation, motorisation, the spread of higher education and mass media development contributes to the fact that the capital city is highly influenced by Western lifestyle. Socio-economic growth means the middle class is increasing and the socio-economic gap between urban and rural life has become larger (Suzuki, 1999). However, a financial crisis in 1997 triggered by a combination of panic on the side of foreign investors in the Southeast Asian regions, including Indonesia, policy mistakes at the onset of the crisis by Asian governments, and poorly designed international rescue programs, resulted in the withdrawal of foreign capital and deepened the crisis more than was either necessary or inevitable (Radelet & Sachs, 1998).

Jakarta not only serves as the capital of the nation, but is also the centre of politics, economics and culture. It is a densely populated city with 750 km^2 and is mostly

urbanised, with large roads on the outskirts forming new satellite towns of Depok, Bogor, Tangerang and Bekasi (Suzuki, 1999). It has a high urban population of 14 million in the year 2005, and up to 18 million during day time with commuters who live in the greater Jakarta area. Roads in Jakarta are congested with nearing 9.5 million vehicles, including 2 million cars and 6.6 million motorcycles. In 2008 alone, car sales increase (The Jakarta Post, 2009).

In Indonesia, ischaemic heart disease is the main cause of death, accounting for up to 14% of deaths (WHO, 2002). After standardising for age, in Indonesia, 344 people per 100,000 of the population, compared with 384 in India, died due to cardiovascular diseases (WHO, 2009).

As a comparison, the following study among Malay-Singaporeans gives an illustration of the prevalence of heart disease in Indonesia compared with other Asian countries. There are similarities between Indonesian and Malaysian people. Both shared a similar ethnic background, traditions, and language. The typical food consumed is similar; rice, which is accompanied by vegetables, fish, chicken or beef. Cooking often involves frying. The use of coconut milk is also common in some areas. Malay people living in Singapore constitute around 13.9%, compared with the majority of Singaporean-Chinese (77%) and Singaporean-Indians (7.7%). A longitudinal study of 12,481 cardiac fatalities on people living in Singapore between the years 1990 to 1999 was conducted by Mak *et al*. (2003). Their longitudinal study found that Malay people living in Singapore, together with Singaporean-Indian people, had a higher rate of heart attack compared with the majority population of Singaporean-Chinese. Singaporean-Indians had a higher rate, but Singaporean-Malays had the highest case-fatality rate. After ten years, the survival rate was lowest among Singaporean-Malays (54.2%), higher among Singaporean-Chinese (56.7%) and the highest survival was among Singaporean-Indians (57.9%). The reported median age was 56 in the year 1991 and dropped to 53 by the end of their study. Singaporean-Malays have the worst

mortality rate compared with Singaporean-Chinese and Singaporean-Indians in general. Although of similar ethnicity, Singaporean-Malays in this study may reflect confounding factors as an ethnic minority group in Singapore.

A high rate of mortality due to heart diseases among Indonesians, may have been caused by lifestyle. Based on The Tobacco Atlas, published by the American Cancer Society, Indonesia is the fifth highest tobacco consumer in the world with total cigarette consumption of 239 billion, after China (2,163 billion), the US (357 billion), Japan (259 billion) and Russia (331 billion) (Shafey, Eriksen, Ross, & MacKay, 2009). Their report estimated that Asia and Australia shares 57% of global cigarette consumption.

Of the population of Indonesian males, over two thirds are smokers (63.2%) compared with only 4.5% of females. In total, 35.4% of the population are smokers. The Centre of Health Research of the University of Indonesia (2001) surveyed smokers living in Jakarta and the rural Sukabumi area. They reported that 40% of these smokers have attempted to quit in the past, on average twice in the past two years. About half of these, stated health as the primary reason, while 35% reported economic reasons. Majority of respondents (90%) in this study were aware of the harmful effect on health. They reported a high number of those who have ever tried smoking among male was high (68%) compared with women (8%). Moreover, in urban area, higher percentage of respondent smokers was in the younger age group, whereas the percentage of smokers was more in older age groups in the rural area. Most importantly, this study reported that, nearly all of boys in the youngest group area, 10 to 14 year olds, have tried smoking (92%). This bias in the sampling indicated that there could a higher proportion of the smoker population who were unaware of the harmful effect of smoking.

Although manufactured cigarettes are also available, kreteks are widely smoked in Indonesia. Kreteks are similar to manufactured cigarettes, but are clove-flavoured.

The health effects of smoking kreteks compared with manufactured ones is unclear. The clove content was thought to replace a proportion of tobacco, making the nicotine content lower compared with manufactured ones. However, The US Centers for Disease Control and Prevention (2009) concluded that kreteks have a higher content of tar, nicotine and carbon monoxide, compared with the manufactured cigarettes. The average manufactured cigarette in the UK contains around 10 to 12 mg of tar, whereas kreteks contain more than double this, ranging from 3.5 mg to 52.3 mg per cigarette in the typical Gudang Garam brand.

Younger people prefer manufactured cigarettes. They are more affordable than kreteks, which can cost more than double those of the manufactured ones, are considered 'lighter', not generating strong smells, and are therefore more appealing. The young female generation is also more likely to smoke.

Smoking is banned in public places in Indonesia, but advertising in the media is allowed. Cigarette companies have a high budget for marketing and advertising. Their commercials are allowed to display their logos, but banned from showing images of smokers and cigarettes. They can be found in large billboards in the main streets, magazines, newspapers and on television after 9.30 PM. With some of the highest spenders in marketing, cigarette companies in Indonesia have been creating award winning advertising. Some of the advertisements are clearly targeting young people.

Government policies on tobacco are relaxed in Indonesia compared with the UK. The reason is that local and international tobacco companies contribute to the economy and create millions of jobs. It is estimated that the tobacco industry employs 11 million workers, directly and indirectly, in Indonesia (Hanusz, 2002).

The price of tobacco, as reported in the Tobacco Atlas, depends on government regulations. Cigarettes in Indonesia are relatively affordable. The most popular brand in Indonesia would cost roughly 50 pence for a packet of 20 cigarettes. The

WHO (2008a) calculates that, on average, smokers spent 6% of the personal income of this middle income country, which is around £1250 required to buy 100 packs of cigarettes. Tax on tobacco in the UK is extremely high at 60%, whereas tobacco tax in Indonesia remains very low at 10%. Indonesia also generates income by exporting cigarettes, mostly to the US, worth around half a billion US dollars (The Associated Press, 2009). Foreign investment has recently taken an interest in kretek market in Indonesia. In 2005, the Phillip Morris, arm of Altria Group Inc's bought nearly one-fifth of the shares of Sampoerna for more than US$ 5 billion (Webb & Permatasari, 2005).

Regarding the prevalence of risk factors, the prevalence of smoking is very high in some Eastern countries compared with the West. There has also been an increase in smoking prevalence among women, particularly in the West. Results from General Household Survey during the year 2006 (Office for National Statistics, 2007) found that up to 23% of men and 21% of women are smokers. For those who smoke, based on this survey, they consume an average of 13.5 cigarettes per day. The proportion of adult smokers is highest among the ages of 20 to 34 years. The rate of smoking has been decreasing rapidly in the past three decades, but has remained steady since early 1990s. Allender *et al*. (2008) also reported gender differences, with a decline in smoking rates over the last 30 years having been faster in men than women. In contrast, the use of tobacco in Indonesia is comparatively high with 69 percent of men reported to be smokers.

Using data from the WHO report from the year 2000, Ezzatti and Lopez (2005) estimate global premature mortality from CHD. They divided 191 countries into 14 sub-regions based on WHO classification and epidemiological characteristics on child and adult mortality. They found a similar tendency globally with smoking being more common in males (47%) than females (12%). However, in high-income countries, the gap was closer with 39% in males and 22% females, whereas in middle- and low- income groups the gap was wider with average of

49% of males smoking compared with 9% of females. They found that in industrialised countries, smoking accounted for 46% of male CHD deaths under 70 years of age, and 19% of females. In the over 70 age group, smoking explained 11% of male deaths and 7% of female. In developing countries, CHD mortality rates due to smoking are lower than in industrialised countries. Among males under 70, smoking explains 20% of deaths compared with 7% in females under 70. Smoking explains 4% of CHD deaths in males over 70 years of age, and 1% in females. However, gender variation in the developing world is larger than in industrialised countries. This study revealed a lower proportion of male smokers compared with the study in Allender *et al*. (2008) described above. Ezzatti and Lopez (2005) reported that more than a quarter of the Indonesian male (27%) smoked compared with 4% of females. They conclude that the smoking epidemic in developing countries is mostly due to socio-economic differences and cultural determinants. They note from this analyses that in developing countries, mortality due to smoking is concentrated in males and in younger age groups, rather than in the older age groups. This trend is even higher compared with industrialised countries. Smoking prevalence in most developing countries has stabilised at high levels, and continues to rise in some countries.

Another common risk factor, diabetes, is also high in prevalence with the WHO estimating the cases of diabetes in Indonesia to be 8.4 billion in the year 2000 (Wild *et al*., 2004).

Cardiovascular disease has different manifestations in Asia compared with West (Woodward *et al*., 2006). Strokes are more common than CHD events, and strokes are often more likely to be haemorrhagic than ischaemic, compared with the West. Most of the existing studies from Asia were of small size or small duration. Therefore, they do not provide reliable information on CHD risk factors in Asia compared with the well-researched situation in the West. The Asia Pacific Cohort Studies Collaboration (APCSC) (Woodward *et al*., 2006) covers studies

from parts of Asia as well as Australia and New Zealand (ANZ), as the 'Western' comparison group. The APCSC is the largest ever study on smoking in the Asia-Pacific region, and one of the largest anywhere in the world. It was aiming to determine the age-specific, sex-specific, and region-specific associations of major cardiovascular risk factors with stroke, CHD and total CVD. Secondary outcomes covered were all-cause mortality and other major causes of death. Studies which were included were those conducted in the Asia-Pacific region, used a cohort study design, and had at least 5000 person-years of follow-up. Individuals within each study were included if they had recordings at baseline, age, sex, blood pressure, and have vital status known at the end of follow-up. Where applicable, age of death should also have been recorded. The cohort studies included were selected on follow-up studies on the healthy population, and not on the basis of a positive disease history or diagnosis.

The studies included were mostly from Southeast Asia and East Asia. There were a total of 562,338 people from 44 studies in the collaboration. There were 35 studies from Asia, sixteen studies from Mainland China (n = 261,000), one study from Hong Kong (n = 3,000), and two studies from Taiwan (n = 8,500), twelve studies from Japan (n = 35,400), one study from South Korea (n = 183,600), one study from Thailand (n = 3,500), two studies from Singapore (n = 5,600). In addition, there were eight studies from Australia (n = 89,300) and New Zealand (n = 10,400). Some major countries in the region such as Indonesia, Malaysia, and in East Asian region, such as India and Pakistan, were not included due to lack of cohort studies in cardiovascular disease in these countries.

In one of the published findings, the APCSC reviewed smoking in Asia and the Pacific region (APCSC, 2005). All data on cigarette smoking were self-reported at the start of participation. There were 32 studies in the Asian region and 8 in ANZ which provided data on current smoking status. Thirty-three of these studies distinguished ex-smokers from those who had never smoked. In this arm of the

study, data were included for individuals who were 20 years or older at baseline for whom smoking status was available. There were no significant differences in the relative effect of smoking on CHD or stroke between Asia and ANZ, or across gender. However, some evidence of a decline in relative effect with age, leading to small effects in those aged older than 75 years. Using studies that differentiate ex-smokers from those who have never-smoked, the CHD relative risk of CHD for current- compared with never-smoked was 1.75 (1.60 - 1.90), and for current- compared with ex-smokers was 0.71 (0.64 - 0.78). There was a positive dose-response relationship between the number of cigarettes smoked and the relative risk for CHD for each Asian studies, those in ANZ, and across gender. CHD relative risk for any level of cigarette smoking was always lower, but did not reach traditional levels of significance. The relative risk for CHD was much higher for women than for men who smoked more than 20 cigarettes per day.

This study confirmed that cigarette smoking is a risk factor for both CHD and stroke, independent of the effects of BMI, blood pressure, and cholesterol, with improvements of the effects after quitting. This study also concluded that smoking is an independent risk factor for haemorrhagic stroke, the most common type of stroke in the Asian region. Women and younger people have greater relative risks of cardiovascular disease from smoking than from other risk factors. Most importantly, they found that people of Asian origin from and Whites participants from ANZ had similar increased proportional cardiovascular risk from smoking and similar relative risk from quitting. This arm of the study showed no relative risk of smoking on CHD and stroke between Asians and ANZ people. There was a difference in the median years of follow-up with studies in Asia being shorter (*Mdn* = 6.3 years) than ANZ (*Mdn* = 8.3 years) which they calculated that relative risk would increase by 2% (0.02-3.7%) for each extra years of follow-up. This study suggested that Asian smokers may tend to have relatively high social class in comparison to smokers in ANZ. Quitting smoking benefited both Asian people

and ANZ people similarly, as there were no differences in the reductions of cardiovascular for those who have stopped smoking.

There will be real benefits of quitting smoking from campaigns to promote quitting smoking in Asia as there is a low quitting smoking rate in this region. (APCSC, 2005). This may also be the reason for the fact that little evidence in the benefits of quitting among Asians. The number of ex-smokers in ANZ studies ranged from 37% to 67% with an average of 59% and in Asia between 1% to 59% with the highest coming from a study in Hong Kong followed by 33% from a study in Beijing (APCSC, 2005). From these studies, the average percentage of Asians who have quit smoking is very low (15%) (APCSC, 2005).

There are limitations and strength to these studies. The strength of the APCSC lies in the large number of participants from different regions. However, there are methodological concerns for this overview of 40 observational studies that spans from 1967 to 1998 (Woo, Yip, Kwan, Chook & Kum, 2005). Woo *et al*. (2005) criticised that smoking types, body mass index, blood pressure and cholesterol levels were missing in some of the studies. If they were measured, the methods are questionable. For example, the measurements of cholesterol were carried out in different laboratories, with different methods and standardisation over nearly four decades; some studies additionally recorded whether individuals were current smokers, ex-smokers or never-smokers, and/or recorded daily cigarette consumptions. Studies for the APCSC were recruited retrospectively, and therefore, the conduct of studies varied.

Currently, there is a knowledge gap in Asia compared with the well-researched West, which may have affected the progress in treating and preventing heart disease in this region (Woodward *et al*., 2006). Very few data are available from Asian countries and therefore there is an over reliance on studies conducted on Western populations, and generalisations may be inappropriate (APCSC, 2005).

3.5 Conclusion

Culture influences people's lives, along with other influences including individual, educational, socio-economic, and environmental factors, which can be risk factors for CHD. Studying these variables in different cultural groups can result in more insight into CHD. Disease should be studied in the context of its cultural meaning (Ahmad, 1996; Hillier & Rahman, 1996; Kleinman, 1981). Otherwise, there will be no basis for advising on how to behave, or the application of interventions. Furthermore, although the study by Lambert and Sevak (1996) was conducted on British minority ethnic groups and compared with those of the British-Whites, which is similar to the proposed study, it was a qualitative based and based on 32 respondents with no personal experience of CHD. A study with a larger sample of British-Eastern and British-White people would be more representative of the population. Studying individuals' experiences of recent heart attack may demonstrate that the hold very different perspectives on CHD to those who remain healthy. Furthermore, to compare this Western sample with a sample of people in the East would show the effect of acculturation. Therefore, this highlights the importance of studying CHD within two completely different cultures.

There is evidence to show that ethnic group membership contributes to the development of CHD risk. The reason for this is mainly that lifestyle is specific to ethnic groups and may have been carried down for generations. For example, alcohol consumption is not common in British Muslim-Pakistani and British-Bangladeshi people; CHD and diabetes are more common among British South-Asian people, while stroke and hypertension are more common among British African-Caribbean people. This knowledge makes it easier for public health workers to target a specific group.

Through epidemiological studies, it has been found that the gap between East and West is widening as there is a tendency for CHD rates to decline in the West, but

unfortunately it seems to be increasing in the East (Marmot & Elliott, 2005). Another important contribution of epidemiological studies of CHD is that, at population level, the epidemic of CHD is due to environmental influences. This is a more positive view as it allows for intervention and the prevention of future CHD (Epstein, 2005). Epstein believes that CHD and most other diseases are the result of what we choose to do, that is, due to lifestyle, rather than what we are. Lifestyle provides the background for genetic variation in contributing to the level of risk factor.

CHD has been studied extensively in Western societies, but there is a lack of studies in the East. As CHD is the most common cause of premature death in both the UK and Indonesia, and is strongly influenced by culture, this has been adopted as the focus of the current research. In England, health services have reached almost every level, whereas in Indonesia health is considered a secondary need. This shows different ways of thinking and beliefs about illness. There is also a vast gap in the amount of research on heart disease between these countries. In the WHO report, during the years 1991 to 2001, there were 2662 reported research studies on cardiovascular disease in the UK, as opposed to only four studies in Indonesia (Mackay & Mensah, 2004).

As stated at the beginning of this chapter, there are many categorisations of the world. Overall, this study prefers to use the term 'East' versus 'West' because the focus is on culture.

People with a first heart attack may regain their motivation to attain the goal of achieving a healthier lifestyle, and prevent a second heart attack. Although culture may affect current lifestyle, it is possible to make changes in culture-based behaviours and thereby influence health status. In order to study cross-cultural aspects of CHD it is necessary to be guided by a model. The following chapter introduces the self-regulation model in relation to health and CHD.

CHAPTER 4 CORONARY HEART DISEASE: A PSYCHOLOGICAL MODEL

4.1 Introduction

On the face of it, it would appear that the self-regulation models in health and illness behaviour provide a useful vehicle for the cross-cultural study of cardiac patients, as it explains the active process of making sense of an illness. Survivors of heart attack may set new health goals to minimise symptoms and to avoid

recurring heart attack in the future. In pursuing these long-term health goals, individuals need to actively update their cognitive and emotional processes. The process of goal attainment within the health domain is the central issue to self-regulation processes in health behaviour.

This chapter begins with the historical background and definition of self-regulation, followed by a discussion of general and health-specific self-regulation models. Explanations are given of the self-regulation model, evidence of the self-regulation model is provided, and then cultural influences on self-regulation are considered, and finally, measurement of the model's components. Essentially, this chapter critically considers the evidence supporting the self-regulation in health and illness behaviour and considers its appropriateness to the study of culture and CHD.

4.2 Self–regulation: Historical background and definitions

Self-regulation broadly refers to the processes of goal setting and goal striving, and includes dealing with a range of challenges that individuals may face when trying to achieve something that is important but difficult to attain (Mischel, Cantor, & Feldman, 1996). Self-regulation is the process by which people bring their behaviours and self-conceptions in line with their goals and standards (Brockner, Paruchuri, Idson & Higgins, 2002). It is a systematic process involving conscious efforts to modulate thoughts, emotions, and behaviours in order to achieve a goal within a changing environment (Zeidner, Boekaerts & Pintrich, 2000).

Bandura's Social Cognitive Theory (Bandura, 1986) played an important part in the development of self-regulation perspectives. His theory suggests that individual behaviour is a means to achieve a desired outcome. This action

expectation reflects the motivational function of reinforcement (Bandura, 1986). An important concept introduced is that of self-efficacy. Self-efficacy is believing that one is capable of attaining goal. A person is more likely to achieve their goal where high efficacy expectations exist, compared with those with low self-efficacy. The impact of self-efficacy on goal setting is the main contribution of the Social Cognitive Theory to self-regulation models.

There are two types of self-regulation models in health psychology; the general model of behaviour and health and illness behaviour. Examples of the general model are Scheier and Carver's Hierarchical Goal and Lazarus and Folkman's Stress Coping Model. Leventhal's Self-Regulation of Health and Illness Behaviour provides the specific model in health and illness context.

4.2.1 *General model of behaviour*

There are two most popular in the category of general model. The first is hierarchical of goals and stress-coping model.

In the first general model of self-regulation, Scheier and Carver's Hierarchical of Goals (1985) placed goals in a linked hierarchy where more abstract goals set as the reference values for concrete goals. Therefore, more abstract goals are considered as higher-level and concrete goals as lower-level. This model is useful to identify the interconnectedness among various goals and to capture the general consistency among goals and the coherence in actions and motivations displayed by an individual (Cameron & Leventhal, 2003).

The second general model of self-regulation is the Stress and Coping model by Lazarus and Folkman (1984). They explain that cognitive appraisal plays a part in emotion as emotions are usually generated following some estimation of the stimulus; action can be both observable and non-observable and hence the term

action impulses is used; and physiological responses accompany emotions. Lazarus (1999) believes that coping is a moderator of the emotional outcome following a stressful situation. He warns that: (1) most research relies on self-report data to find a relationship between coping and particular emotional outcomes, which increases the possibility of confounding variables in coping processes and outcome measures; and (2) some coping strategies, such as distancing and denial, may be beneficial at certain times, but may be non-adaptive at other times, so more research is needed on coping functionality in diverse situations (see section 4.3.6 for further explanations on denial).

4.2.2 *Self-regulation of health and illness behaviour*

The self-regulation of health and illness behaviour was developed by Leventhal. During the sixties, Leventhal *et al*. developed their early interest in researching fear arousal in dealing with health threats. Fear arousal is particularly popular in health information targeted at changing unhealthy behaviours. A fear appeal is a unit of persuasive health information that arouses fear in order to promote healthier behaviour by alarming the audience that their current behaviour may result in negative health consequences (Ruiter, Abraham & Van Eersel (2001a); Ruiter, Verplanken, Kok & Werrij, 2001; Barth & Bengel, 2000). Fear appeals attempt to prevent the audience from experiencing harmful consequences. The rationale behind fear appeals is to advise people to act in their own best interest by informing them about the negative consequences that are likely to occur but can be avoided with an appropriate adaptive responses (Rippetoe & Rogers, 1987).

Rogers' Protection Motivation Theory (Rogers & Deckner, 1975; Rippetoe & Rogers, 1987) explains how fear appeals persuade people to change. First, fear-arousing information is categorised as external or internal. When the information is considered to be internal, that is, when the recipient feels susceptible, a coping appraisal process will be activated. On the one hand, an adaptive response may be

adopted that reduces the threat. Selection of this coping mode depends on whether the recommended precaution is evaluated as sufficient to avert the threat, that is response efficacy and is perceived as feasible, that is, self-efficacy. On the other hand, the threat would remain the same or even be intensified when people flee into a defensive coping mode of denying the threat or derogating the health information, so-called maladaptive responses, to simply reduce feelings of fear (Ruiter *et al*., 2001a; Ruiter, Abraham, & Van Eersel, 2001b; Witte, 1992; Rippetoe & Rogers, 1987).

Leventhal *et al*. (1980) found mixed results in fear appeals; although fear did change behaviour in their studies, in some studies, high fear arousal seemed to generate avoidance responses. Following years of research on fear, Leventhal *et al*. (1980) concluded generally that: (1) information about health containing fear arousal is insufficient to promote long-term behavioural change, and (2) to be effective, this health threat information needs to be accompanied by an action plan. These conclusions regarding fear arousing messages generated questions about how individuals cope with fear and how individuals perceive threat.

More than a decade later, interest in regulating emotions in health settings, fear of pain, injury, loss of control and death can direct symptom selection, causal attributions, and coping efforts at different times during the process of threat control. Fear can be beneficial to treatment adherence (Leventhal & Johnson, 1983).

There are three important principles in behavioural regulation. *Leventhal et al*. (1980) formulated that: (1) perceptions about an event and subjective emotions generate goals for coping, (2) the importance of an action plan and goals; (3) (health) information available influences the representation of (illness) danger and the action plan. These principles suggest that not only insufficient (health) information, but also individuals' representation of (illness) danger and coping

reactions to health threats may induce non-adherence. This highlights the importance of the representation of illness danger and coping in reaching goals in understanding adherence.

In constructing their model, Leventhal *et al*. (1980) incorporated the processes involved in the construction of perceived vulnerability, severity, and effectiveness. They started with an interest in how patients comply with specific treatments. Their underlying assumption is that individuals are active and self-regulating problem solvers, and are motivated to avoid and treat illness threats. Therefore, their goal was to comprehend this process. From their previous principles, they narrowed down to four important bases to the processes of illness cognition (Leventhal & Nerenz, 1985). First, they acknowledge that people are active problem solvers who continue to update their knowledge and interact with the environment; second, cognitive processes involved in the CSM are not always observable; third, behaviour is episodic in organisation and it is constantly updated following new information; and finally, there is great variety in CSM as there are many situational factors and individual schemata that can play a part at a given time. The CSM explains the parallel processing of problem-focused and emotion-focused goals, using both cognitive and behavioural processes to control the health goal and regulate emotional distress (Cameron & Leventhal, 2003).

There are three processes involved in CSM. The first stage is the *problem presentation* where the problem and goals for action are identified. The second stage is *action plan* in which coping efforts are perceived as relevant to the problem presentation. An action plan is a result of a concrete representation of an illness; distress is the result of goals which are abstract, and therefore difficult to attain (Leventhal & Nerenz, 1985). Finally, the *appraisal process* is the assessment of the goal attainment process (Leventhal & Nerenz, 1985, Carver & Scheier, 1994; Mischel *et al*., 1996).

Health threat stimuli activate two motivational systems: cognitive processes for regulating the health threat, and emotional processes for regulating anxiety and fear (Cameron & Jago, 2008). The CSM explains the parallel processing of problem-focused and emotion-focused goals, using both cognitive and behavioural processes to control the health goal and regulate emotional distress (Cameron & Leventhal, 2003).

Leventhal proposes that individuals use an active on-going information processing system as presented in the feedback loop in the model (see figure 4.1 below). This is a result of individuals actively interpreting information and coping when problems arise and theories about an illness may change over time as a result of bodily experience, health information, or past experience (Leventhal & Nerenz, 1985). This leads them to generate a cognitive representation and an emotional reaction to their condition. There are three interrelated phases involved: (1) illness representation which then leads to (2) coping for planning and executing a health-related response, and resulting from this (3) an appraisal to evaluate coping successes. Cameron and Leventhal (2003) concluded that there were two common properties shared in the studies of CSM that self-regulation as goal-achieving behaviour, and self-regulation contained emotional responses, which is linked closely with cognitive processes.

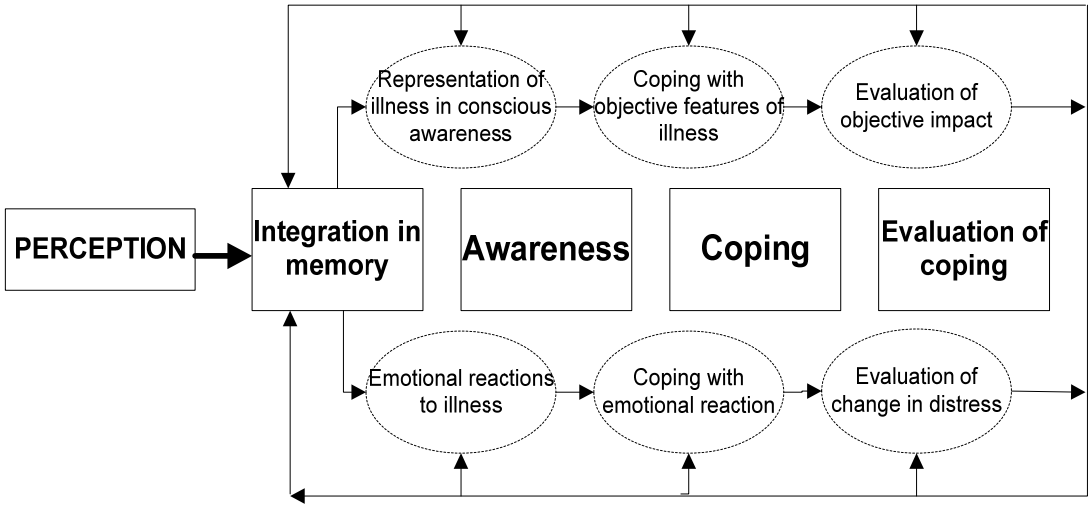

Figure 4.1

Self-regulating processing system in common-sense model of self-regulation (Leventhal et al., 1984)

The CSM has been criticised for ignoring external environment (e.g. Ogden, 1995). This is a misconception as the CSM do not dissociate individuals from reality has been put forward. The process of the CSM involves individuals' need for efficient adaptation to the environment, and this may require altering behavioural strategies or tactics, redefining or altering goals, or modifying the environment (Leventhal, Leventhal & Contrada, 1998).

Cameron and Leventhal (2003) acknowledged the role of context, particularly socio-economic and socio-cultural, in goal striving behaviour. They explained that social and economic resources constrain or permit health-related behaviour and influence cognitive and affective experiences when dealing with health. Furthermore, socio-cultural factors affect components of self-regulation. They affect definitions of the self, construal of illness, development of desires and goals, identification of strategies, reference value for appraising progress, use of emotional responses and use of emotional regulation strategies. Self-regulation theory offers a framework with which to systematically examine the interactions

between persons and contexts – that is, how self-regulation is linked with social relationships and the cultural environment.

There are many terms used to explain this model. Leventhal, when he began to develop the theory in the seventies, accommodated the term 'Parallel Response Model' and 'Common-Sense Model of Illness Danger' was used in Leventhal and Nerenz (1985), as well as 'Common-Sense Model of Illness Threat' in Leventhal, Leventhal and Contrada (1998). This thesis follows the British Journal of Health Psychology in using the term 'Common-Sense Model of Self-Regulation'. This term appeared in the special edition dedicated to this model in November 2007. Hence, throughout this thesis the model will be referred to 'Common-Sense Model of Self-Regulation' (CSM).

This model is designed particularly for use in the health and illness context. This model is somewhat different from self-regulation in other behaviours since to some extent, in the health context, the regulation may not be entirely volitional. Following 'doctor's orders', for example, may be the regulating behaviour (De Ridder & De Wit, 2006). For this reason, this thesis will utilise this model to explain how individuals with a recent heart attack strive to reach health goals.

The following section further explains the motivational systems of the CSM: cognitive processes and emotional processes.

4.3 The common-sense model of self-regulation in coronary heart disease

4.3.1 *Cognitive processes of the common-sense model of health and illness behaviour*

The cognitive processes involve the activation and development of illness beliefs that are guiding the use of strategies for controlling the illness (Cameron & Jago, 2008).

Morrison and Bennett (2006, p. 251) define illness beliefs as:

> "…organised conceptions of individual illnesses acquired through the media, through personal experience, and from family and friends."

There are other terms to define this, such as cognitive schemata, illness cognitions, and illness beliefs, these may sometimes be inaccurate but they influence preventive behaviour (Morrison & Bennett, 2006).

Illness beliefs are the basis for self-regulating behaviours. Individuals generate their own theory of the illness based on their understanding, which is often implicit, of the symptoms, what they believe to be the cause of the illness and the treatment available (Leventhal & Nerenz, 1985). Not only do symptoms accompany illness, but early symptoms alone may raise perceptions towards an illness (Leventhal & Nerenz, 1985). The notion of illness beliefs is exemplified by the need to evaluate, and make sense of their symptoms, illness, health risks and responses to disease (Weinman & Petrie, 1997). Illness beliefs involve complex cognitive models that influence both their psychological and physical functioning (Mæland & Havik, 1987).

In their earlier work, Leventhal and Nerenz (1985) identified four dimensions of illness beliefs. They are: (1) identity, (2) consequences, (3) causes and (4) timeline.

Illness identity is defining an illness comes from making sense of symptoms (Charmaz, 2000). Symptoms often serve as a guide in determining the cause of an illness and for evaluating treatment (Leventhal & Nerenz, 1985). Perceived illness identity can be defined abstractly as labels (e.g. cancer, heart attack), concretely by signs (e.g. sores, bleeding) or by symptoms (e.g. chest pain, irregular heartbeat). The next dimension is perceived illness consequences. The consequence of an illness can affect perceived physical, social and economic consequences of the illness, including its emotional consequences (e.g. shame or despair). The third dimension, perceived causes, is related to the perceived causal attributions to the illness (e.g. genetic, smoking-related, stress). Finally, perceived timeline of an illness is the perceived time frame and duration of the illness threat. Later, Lau and Hartman (1983) added a fifth dimension: curability or controllability. Moss-Morris *et al*. (2002) suggest an illness beliefs model composed of: perceived illness *identity* - which is comprised of the symptoms the patient views as being part of the disease; perceived *cause* - personal ideas on what causes the illness; perceived illness *timeline* – expected duration of the disease; perceived illness *consequences* - expected effects and outcome of the illness; and perceived treatment or cure *control* - how one controls the illness.

Illness beliefs serve as a base to evaluate and regulate treatment (Leventhal & Nerenz, 1985). How much a person believes in treatments and how much control they have over their illness is important in extracting a complete picture of their illness representations. This additional dimension is reflected in *personal control* and *treatment control* scale in the Illness Perception Questionnaire.

Behaviour and feelings about the disease, and its psychological outcomes, are affected from the very beginning of an individual's disease (Petrie *et al*., 1996). This makes the initial phase, when the individual has just learnt about their heart attack, crucial. During this phase, people struggle to regain control and then, rather than accepting their symptoms as an extraordinary event, they try to normalise them. Normalising means making illness and treatment regimens part of individuals' daily routine and treating the changes as ordinary in order to reduce disruption and the impact of disabilities (Charmaz, 2000).

It has been found that during hospitalisation following a heart attack, survivors' illness beliefs and their expectation of return to work are strong predictors of their return to work six months later (Mæland & Havik, 1987). Furthermore, Petrie *et al*. (1996) found in their study that when cardiac disease is perceived to be more life-threatening by patients, recovery and return to work take longer and there is decreased psychological functioning. They also found that cardiac patients who perceived their illness to be curable also thought that their recovery period would be shorter and less life threatening than those who believed their illness to be incurable. It appears that perception of serious consequences and physical disease-related symptoms were associated with expectations that the illness would be lengthy in duration. They concluded that patients who exhibited fewer symptoms believed their illness to be more controllable and that it would have less impact on their life.

In the US, Cherrington, Maser, Lennie, and Kennedy (2004), between the years 1999 and 2001, conducted a research study on 49 in-patients within 24 to 48 hours of admission which consisted of equal numbers of Caucasian males and females. These patients completed the Illness Perception Questionnaire (Weinman, Petrie, Moss-Morris, & Horne, 1996) to measure their illness beliefs, the Spielberger State Anxiety Inventory to measure their anxiety level, and the Beck Depression Inventory to measure depression. This study concluded that during hospital stay,

medical complications, along with more feelings of depression and/or anxiety, were more likely to occur among those who had a negative representation of their heart attack. Petrie *et al*. (2002) found that in the early stage, an intervention designed to change perceptions of heart attack resulted in a faster recovery, quicker return to work, and greater likelihood of attending CR programme after three months. Following this intervention, people viewed their illness as short-lived, as being controllable or curable, and less disruptive to their personal life than the control group. Those who perceived their illness more optimistically reported fewer angina symptoms. This resulted in a better HRQOL compared with those who were less positive and had an inaccurate view of their condition.

Individuals going through CABG surgery undergo a tremendous amount of emotional stress when dealing with their disease, which is reflected in high levels of anxiety, depression and other emotional disturbances (Hagan, 1991). There also appears to be a relationship between illness beliefs and adherence to secondary preventive behaviour. Secondary preventive behaviours include smoking cessation, exercise, dietary fat consumption, alcohol consumption, and medication adherence. A study of 1084 patients with CHD by Byrne, Walsh, and Murphy (2005) suggested that a stronger belief in one's own behaviour as a cause of illness was related to greater consumption of alcohol. Beliefs in benefits of medication appeared to be a good predictor of medication adherence. This means, those who believe that their medication will prevent and cure their disease, will be more likely to regularly take their medicines. Furthermore, low emotionality was related to frequent exercising, but was also related to a greater consumption of alcohol. Patients who blamed themselves for the illness, and who had a lower level of emotionality were more likely to report unhealthy consumption of alcohol. The explanation for this is that those patients were more pessimistic, and perhaps more realistic about the severity of their condition.

Illness beliefs are influence by external environment. There are two ways in which social and cultural factors influence individuals' illness beliefs: (1) culture provided linguistic labels for differentiating and categorizing the events that are surrounding illness and (2) specific social contacts can influence the interpretation of somatic information (Leventhal *et al*., 1998).

Mental representations of actual or future health threats, will elicit coping strategies. The selection of coping strategies is based on the timeline, causes or consequences in mental representation. Outcomes of strategies to control illness are appraised to determine success. This appraisal is used to modify the illness representations created in the beginning and coping behaviours (Cameron & Jago, 2008). The following section explains the emotion regulation arm of the CSM.

4.3.2 *Emotional processes of the common-sense model of health and illness behaviour*

Emotional regulation is a crucial element of the motivational system. These responses act as: (1) direct responses to appraisals of goal related progress, (2) experiences to be regulated, and (3) influences on cognitions and behaviours (Cameron & Leventhal, 2003). Emotional system involves the reduction of anxiety and fear, which motivate behaviour to control distress. Appraisals following success are used in modifying further regulating efforts (Cameron & Jago, 2008). More importantly, the specific procedures and strategies in regulating are defined by properties of the threat to health, as well as the resources that are available to the individual and the social context and culture (Cameron & Leventhal, 2003).

Hagger, Chatzisarantis, Griffin, and Thatcher (2005) explain that a coping procedure will be adopted when the individual feels threatened by the illness. This can either be active coping (behavioural), or passive (psychological). A coping

procedure is a response to the cognitive and emotional components of the representation, simultaneously in a parallel process. Goals vary in different ways. Not only can goals be either discrepancy-reducing (approach) or discrepancy-enlarging (avoidance) (Rasmussen, Wrosch, Scheier & Carver, 2006).

Each strategy is unique and performs a different function at a given time. Hence, there is no best strategy. As Lazarus and Folkman (1991) suggest, efforts to overcome a stressful situation is what is important, and not the outcome and the appropriateness of a strategy is determined through its effects at present and in the future.

In researching coping, Lazarus and Folkman (1991) conclude that: (1) each coping strategy should not be viewed as inherently good or bad; (2) the context should be taken into account; and (3) both situational and personal aspects are important in a coping process.

4.3.2.1 Approaches to coping

Coping and stress were studied extensively during the 1960s and 1970s, even before the birth of CSM. Coping is thought to generate from a psychoanalytical interest as ego-defences (Lazarus, 1983). There are two main approaches to viewing coping; coping can be viewed as a trait, as a style, or as a process. Lazarus proposed three ways to view coping as a trait or as a coping style: (1) coping as habits, (2) dispositional coping, and (3) coping as conditional trait. Cohen (1991) explains that coping dispositions refer to one's tendencies to choose a particular coping in a variety of stressful situations, whereas coping as conditional trait or episodic coping is the strategies individuals actually use in coping with a specific situation. However, he adds that, dispositional coping has been criticised as coping dispositions do not seem to be predictive of how a person will cope in a stressful situations. In addition, in dealing with different aspects of

a particular situation, a person may not consistently use the same way of coping. In summary, coping dispositions reflect general dimension of personality, rather than tendencies to cope in a stable way and may show meaningful good predictive validity to health-related outcomes.

Carver and Scheier (1994) explored the dynamics between coping and emotions, and then examined the relationship between situational coping and emotions, and examining how dispositional coping styles were related to both situational coping and emotions. They tried to make this study comparable to the study by Folkman and Lazarus (1983). They first explored the dynamics of dispositional coping, as well as coping strategies before and after knowing the outcome using 125 first-year undergraduate psychology students. Carver and Scheier assessed coping styles at the beginning of the semester, measured using the dispositional COPE: scale a four-point scale, from 'I usually don't do this at all' to 'I usually do this a lot'. In addition, they also assessed coping strategies at different time points around the exam: before and after exam, and after the grades were announced. They used the same scale using options altered for the type of coping measured and depending on the time points. For example: in *planning* coping, the statements 'I am making a plan of action' or 'I have been making a plan of action' and the options 'I have been making a plan of action' or 'I haven't been making a plan of action'. Finally, similarly to Folkman and Lazarus, they measured appraisal-related emotions of threat and challenge, and harm and benefit. Threat was assessed with the following emotions: confident, hopeful and eager; and challenge with: confident, hopeful and eager. Harm was assessed with angry, disappointment; and guilty with: pleased, happy, and relieved. Each emotion is measured using the scale of 1 to 5 in respect of the exam. They found that coping dispositions did not predict emotion significantly. However, dispositional denial and dispositional use of social support were found to be related to threat, and

dispositional alcohol consumption was related to threat and harm. They found that dispositional coping can predict situational coping at low to moderate levels.

Lazarus himself proposes several criticisms in viewing coping as a trait. He argues that this approach oversimplifies the phenomenon, ignoring motivations in dealing with different situations. In assessing coping styles, it ignores the people in the middle group who do not contribute to the outcome variance. More importantly, research using this approach often ignores coping approach in different situations and times. Instead, he proposed that coping should be viewed as a process.

Lazarus (1999) suggests that coping and its outcomes must be measured separately, so each coping strategy can be properly evaluated. Efficacy is influenced by the type of person, the type of threat, the stage of the stressful encounter, subjective well-being and social functioning. The process is contextual because these dimensions change over time. Therefore, research on coping needs to take into account the thinking process and behaviour at each stage and the context in which it takes place.

4.3.2.2 Functions of coping

Lazarus and Folkman (1991) point out two functions of coping: problem- and emotion-focused. Problem-focused coping is often utilised when the outcome is perceived as likely to be changed, and emotion-focused is opted when the outcome is perceived as unchangeable. Lazarus (1999) also adds that problem-focused coping is where the individual takes action to change the reality based on the information gathered; whereas a way of thinking to change the emotions related to the stress situation is emotion-focused. Problem-focused coping is more likely to be used in situations where stress is viewed as within the individual's control; whilst emotion-focus in situations where stress is perceived as unchangeable.

Often, problem-focused coping is seen as the more adaptive way of coping, however, emotion-focused can be adaptive to health and well-being. Lazarus concludes that both coping strategies are important in general coping effort. Ideally, each coping strategy should facilitate the other.

Lazarus (1983) proposes that there is a tendency to opt for problem-focused behaviour in Western culture and to distrust emotional-focused coping. The reason is probably that taking action against problems rather than reappraising the relational meaning seems more desirable. He notes that problem-focused may turn out to be counterproductive when there is nothing useful that can be done to change the situation. This might lead to chronic stress.

There is a dynamic relationship between coping and the ever changing environment. Lazarus explains that coping efficacy is determined by the balance between thinking and action, and the environment realities. He adds that coping functions and strategies should be considered as a complex interconnected with the environment. Coping also depends on an appraisal process, where it seeks meaning that supports realistic actions and views the situations in the most favourable way.

Lazarus notes that individual differences are important in coping, that is, there are individual differences in reaction to coping when faced with a similar situation. This is explained by personal characteristics (e.g. motivation: values, commitments, goals), personal resources (e.g. financial, social and problem-solving skills, health), and beliefs about oneself and the surroundings.

4.3.2.3 Research on coping

There have been reports on gender differences in coping behaviour. Through a meta-analysis, Kristofferzon, Löfmark and Carlsson (2003a) suggest that, although

both men and women use a variety of coping strategies, women are likely to use a wider range of coping strategies than men.

In a different study in Sweden, Kristofferzon *et al*. (2005) report that, among heart attack sufferers, coping styles are generally stable over time, with the exception that fatalistic coping diminishes over time among men. Also, women use more evasive and supportive coping by seeking support from their grandchildren and church community, and she reports a lower HRQOL than men (Kristofferzon, Löfmark, & Carlsson, 2003b; 2005). Moreover, women experienced more problems than men after four and twelve months. This study used the Jalowiec coping scale, SF-36, and HRQOL was measured by Quality of Life-Cardiac Version. The Jalowiec coping scale consists of eight coping strategies which include: (1) confrontive ("tried to change the situation"), (2) optimistic ("tried to think positively"), (3) fatalistic ("accepted the situation because very little could be done"), (4) emotive ("worried about the problem"), (5) palliative ("tried to keep busy"), (6) self-reliant ("prefer to work thing out yourself"), (7) supportive ("depended on others to help you out"), and (8) evasive ("put off facing up to the problem") (Wahl, Moum, Hanestad & Kalfoss, 1999). Kristofferzon *et al*. (2005) also found that approach coping has positive outcomes in the long run. Overall, their study concludes that for HRQOL, there is no significant difference between men and women at any point at any time. HRQOL seems to improve over time.

Studies of CR programmes by Whitmarsh, Koutmatji and Sidell (2003) identified psychological variables among poor or non-attenders. They have greater perceptions of the number of symptoms and consequences of their illness; and they use problem-focused coping less frequently and use maladaptive coping more frequently. The assessment of problem focused coping is based on active coping, planning, seeking instrumental social support, suppression activities, and restraint coping. Emotional focus is defined as seeking emotional social support, turning to religion, positive reinterpretation and growth, and acceptance. Maladaptive

coping is the venting of emotions, denial, mental disengagement, and behavioural disagreement. It was also found that the attenders had greater symptoms of anxiety and depression compared with poor or non-attenders.

In relation to coping strategies, Shen, McCreary and Myers (2004) found that optimism and social support contributed both directly and indirectly to: the mediation of less passive coping and lower depressive symptoms; improved physical functioning; after controlling for age, the likelihood of recurring heart attack; physical functioning at baseline; and other psychosocial correlates.

4.3.2.4 The role of denial in recovery from a cardiac event

Lazarus (1983) defines denial as "... the negation of something in word or act, or more properly, both, since thoughts and actions are apt to be conjoined in any defence process" (p.10). Similarly, Janis (1983) also defines denial as "... a tendency to minimize or fail to appraise correctly and undesirable personal characteristics or event" (p.3). Furthermore, Lazarus and Folkman (1991) also describe denial as: "..the disavowal of reality" and "...a way of disregarding a threat" (p.202).

Janis concludes that there are several principles of denial: (1) denial can be both harmful and beneficial, and should be considered in context of where it occurs, (2) denial may prevent mastery when facing a particular recurring stressful situation, which means there are time-related implications when using denial, (3) denial should be used as a temporary preservative, but later on, problem-focus coping needs to take place, and (4) some types of denial are valuable and some can be harmful, for example, it is more harmful to deny what is clear and unambiguous than denying uncertainties. Stressful events can be seen as challenging for some, but a threat for others.

Evidence suggests that denial has denial may have a protective role in the acute phase of CHD (Levenson, Mishra, Hamer, & Hastillo, 1989). Denial is a common initial reaction to a cardiac event (Hackett & Cassem, 1974; Levine *et al*., 1987) which takes the form of denying that they have had a heart attack, underestimating the seriousness of their heart condition, minimising their emotional distress, misattributing symptoms, or ignoring threatening information (Lazarus, 1983). In people diagnosed with unstable angina, deniers are found to stabilise twice as fast compared to the non-deniers (Levenson *et al*., 1989). Moreover, Hackett and Cassem (1974) found that denial is an effective way to minimise anxiety. Later Hackett *et al*. (1968) added that as deniers with heart attack are more likely to survive than non-deniers.

Further studies have found that in the long run, denial is found to hinder recovery. Deniers showed poor adaptation, both physical (Mullen & Suls, 1982) and non-physical (Suls & Fletcher, 1985); and less instrumental problem-solving behaviours, which are necessary to deal with chronic stress (Janis, 1983). However, other studies failed to replicate similar results on the long-term effects of denial. There is no significant link between denial and morbidity (Dimsdale & Hackett, 1982), or with medical outcome (Shaw *et al*., 1985). In addition, people who deny that they have had a heart attack are less well-informed about heart attack following CR programme, more than non-deniers (Shaw, Cohen, Doyle, & Palesky, 1985); deniers either delay seeking medical help, or refuse the recommended self-care (Croog, Shapiro & Levine, 1971). Gentry and Haney (1975) concluded from their study that those who fail to seek medical help immediately following their heart attack are less likely to believe that they had a heart attack and their recovery is worse than the non-deniers.

Levine *et al*. (1987) argue that the reason behind these differences lies in the fact that most of those studies used the semi-structured interview Denial Scale. They claim that the Denial Scale may not be a robust measurement as it contains items

that are not related to the illness. Another reason for the different findings over a longer period of time is because those studies do not measure level and modes of denial at different time points. Based on this idea, they developed an interview instrument, the Levine Denial of Illness Scale on men who had a heart attack or after CABG surgery. This measures the level and modes of denial. They found that in the short-term, deniers spent fewer days in hospital and have fewer signs of cardiac dysfunction, but when they were re-hospitalised within one year, the deniers spend a longer time in hospital. Their research findings confirm that denial is associated with faster recovery only in the acute phase, but in the long run the deniers show poorer recovery compared with the non-deniers.

There is further evidence of the positive consequences of denial. In a qualitative study by Druss and Douglas (1988) of three cases of denial of illness and disability, which included a person with CHD, it was shown that deniers were able to focus on the positive side and not on the threatening aspects of their conditions. However, there is the possibility that these individuals showed optimism, instead of denial. Optimism is different from denial, where optimism is a generalisation of expectancy for positive outcome (Scheier & Carver, 1985).

However, later findings found evidence for the opposite consequence of denial. When Levenson *et al*. (1989) replicated their 1984 study and included more people, 48 compared with only 21 people with unstable angina in their earlier study. Twenty-five of them fell into the category of high deniers, and 23 low deniers using the Hackett-Cassem Denial Scale. In their study they also looked at comparable socio-demographic, risk factors associated with CHD, cardiac history, medical treatment, vital signs and cardiac catheterisation at baseline for both groups, which was missing from the earlier study. Their study concluded that low deniers showed a significantly worse medical outcome with 92% of high deniers reaching stabilisation compared with only 65% in the low deniers, but failed to show a similar result to their previous study (Levenson *et al*., 1989). Hence, there

was no significant difference in the time spent in hospital. In addition, they also found that low deniers were more likely to receive an intravenous nitroglycerin drip in this study which is required for people who fail to stabilise with nitrates given through other routes. They proposed several explanations for the difference between their 1984 and 1987 results. Their 1987 sample included more participants, more women, more African-American people, were more likely to be retired, were more likely to have had previous CABG surgery, and half of them received CABG compared with none in the 1984 study. Further, the difference may be related to a change in the treatment philosophy whereby failure to stabilise was more likely to lead to referral for surgery, and to the introduction of new anti-anginal drugs.

A decade later, Van Elderen, Maes and Dusseldorp (1999) conducted a longitudinal study on the difference between approach and avoidance coping in anxiety, depression, and well-being. Their study included 244 Dutch men and 34 Dutch women with both heart attack and angina, but also included a number of people who had an angioplasty intervention or CABG surgery, as well as a combination of these. Forty-six of them failed to complete the study 12 months later. The conclusion of their study confirms previous findings that avoidance coping after one month is related to better well-being, lower anxiety and depression. This does not persist after 6 and 12 months. Also, approach coping strategies, which are targeted at emotional problems, are related to worse well-being and more anxiety and depression. Thus, 'the work of worrying' in the short term can have a positive effect on emotional functioning at a later time. Their possible explanation for this is that, shortly after a cardiac event, emotional upheaval may generate a sort of necessary trauma processing phase. Janis (1983) has a similar view: when there are perceived losses from any alternative that might be selected along with no hope for finding a solution, then any available

information may be interpreted subjectively. This situation created an opportunity for defensive avoidance.

Denial as a type of avoidance coping has three sub-patterns, all which are related to information preference: (1) procrastination may appear in the absence of deadline pressures and be associated with information evasion; (2) seeking out others when deadline pressures are present and a possibility to pass over the responsibility to someone else, and (3) when strong deadline pressures are present, but there is no possibility to pass the responsibility to someone else, then selective exposure will be likely to occur marked by information gathering that supports the least objectionable alternative and avoidance of discrepant information (Janis, 1983). As an example, when smokers are presented with videos about the negative consequences of smoking, the MRI-scan shows that they divert their attention away from the information (Ruiter, Kessels, Jansma, & Brug, 2006).

4.3.2.6 Critics of the process view of coping

There are some criticisms of coping as a process. Coping as a process is currently the most widely accepted view of coping and has been the based on many measurements of coping. Despite favouring for this approach, Lazarus also criticises the process approach as being too contextual, and may overlook the overall picture, such as, personality variables, coordinated strategies in dealing with life, life goals, and the drive that makes an individual move in a steady adaptational direction.

Stronger criticisms have been posed by Coyne and Gottlieb (1996). They begin by criticising the widely accepted definition of coping. They criticise the definition of coping by Folkman and Lazarus as being restrictive. They propose that much coping often involves anticipation, which is not mentioned in the definition. They give an example in congestive heart failure sufferers who anticipate and avoid the

chance of complications by regulating their medication regime and its side effects, diet, exercise and fluid intake. They claim that anticipatory coping changes the relationship between stress and coping:

> "Anticipatory coping may affect the occurrence and character of stressful episodes related to medical conditions, including the degree of psychological distress associated with them and the extent to which they can be managed without more effortful coping. Moreover, at its most effective, anticipatory coping should profoundly affect what the respondent needs to do in order to cope with the stressful episodes when they occur and may even leave a respondent with no relevant stressful episodes to report. By ignoring these influences, we produce a distorted picture of stress and coping processes and are likely to make erroneous inferences about the efficacy of coping as it is conventionally defined and assessed." (p. 962).

Also, Coyne and Gottlieb consider that the definition by Lazarus and Folkman is dismissive of habitual or automated behaviour. They argue that adopting an automated response to stress should also be considered as coping, despite the fact that they can be ineffective. In some cases, overcoming or compensating for these automated responses, constitutes basic coping. Coyne and Gottlieb also add that effective habits and appropriate reflexive responses will generate minimised effort in coping with stressful situations. They also argue that the conventional measurement of coping, such as Ways of Coping, also reflects habitual patterns, for example an item of "I jogged or exercise". In many cases, it is difficult to differentiate between habitual or reflexive responses to an effortful and deliberate act. They anticipate that effective habits and appropriate automatic responses will result in a less effort in coping with a particular stressful situation. Therefore, Coyne and Gottlieb argue that anticipatory coping and automated coping are also important aspects of coping that should be integrated in the definition, not only

concentrating on deliberate coping strategies after a stressful situation. This would help in better understanding coping and generating more research on these aspects.

Coyne and Gottlieb also criticise the transactional process of coping as proposed by Lazarus and Folkman. The transactional view of coping is the foundation of the study of coping. The transactional view of coping stressed the dynamic, mutual reciprocal and bidirectional perspective. Coyne and Gottlieb found that the transactional perspective treats individuals and environments as inseparable, unlike the interactive perspective where individuals and environments are treated as separable. They argue that the current research direction of measuring coping with checklists are ignoring trait variables, past adaptive or maladaptive coping and only assess situation-specific coping. As a result, the individual response to the most recent stressful event may provide a distorted picture of their coping.

Some researchers have acknowledged these problems and they use statistical control in their studies of coping (such as controlling for gender and age). However, Coyne and Gottlieb make the criticism that controlling these variables may undermine the coping itself. To have a better understanding of coping ability and effectiveness, a lot of information is needed about the situation where stressors occur and the complex relationships between person and situational variables and coping over time. They conclude that:

> "..the inappropriate use of statistical controls in efforts to circumvent such fundamental differences in less politically charged research is commonplace, and in fact is more the rule than the exception." (p. 968).

The transactional view of coping, as proposed by Lazarus and Folkman, dismisses the role of personality in coping. Coyne and Gottlieb argue that there is an overlap between study of personality and coping. Personality can be construed in terms of what situations afford for particular individuals. In addition, how individuals

construct and respond to a situation. This makes coping checklists ambiguous and inconsistent in measuring a particular situation.

Furthermore, De Ridder and De Witt (2006) suggested that research using this model may underestimate the role of coping as the model does not emphasise goal frustrations (De Ridder & De Wit, 2006). Mental representations of actual or future health threats, will elicit coping strategies. The selection of coping strategies is based on the timeline, causes or consequences in mental representation.

4.4 Evidence for the common-sense model of self-regulation

When formulating the original Illness Perception Questionnaire, Weinman, Petrie, Moss-Morris and Horne (1996) found that in their model, "… coping is a mediating factor between illness representations and outcome" (p. 441), but in chronic fatigue syndrome sufferers, illness beliefs predicted distress and disability more strongly than coping did. They concluded that coping did not mediate illness beliefs and mood and adjustment. Similarly, another study in Addison's disease (Heijmans, 1999) also concluded that:

> "… coping did not appear to mediate the relations between the illness representations and aspects of outcome except for mental health (p. 147)."

Years later, when revising the Illness Perception Questionnaire, Moss-Morris, Weinman, Petrie, Horne, Cameron and Buick (2002) added an emotional representation scale to represent the emotional part of the Leventhal's CSM. They tested this revised version in eight samples of illness groups. One finding was that emotional representations were unrelated to severity in multiple sclerosis. However, they also found that severity of consequences seemed to affect the emotional representation of the sample of people with multiple sclerosis.

These findings suggest that illness beliefs are independent of coping strategies and directly influence coping behaviour.

In a prospective study of 134 people with type 2 diabetes, Searle, Norman, Thompson and Vedhara (2007), explore the relationship between illness beliefs, coping cognitions and coping behaviour, such as diet, physical activity, medication adherence, measured after 12 months. Illness beliefs were measured using the Revised-Illness Perceptions Questionnaire and coping cognitions were measured using Medical Modes of Coping Questionnaire (MCMQ). This study used the longer version of Revised-Illness Perceptions Questionnaire instead of the brief version. The reason may be that the first manuscript was received in early 2006 before B-IPQ was published. The MCMQ measures 'confrontation', which is similar to the 'active' and 'planning' coping scales in COPE. In addition, it also measures 'avoidance' and 'acceptance-resignation'. Using a more conservative *p* value of .01 in conducting these multiple tests to reduce the possibility of type 1 error, they found that some components of illness beliefs are related to coping cognitions and coping behaviours.

In their correlational analysis, they found positive correlations between perceived illness *consequences* and *confrontational* coping; perceived illness *identity* and *avoidance* coping; and both perceived emotional representations regarding diabetes and perceived identity with acceptance coping. There were also positive associations between illness beliefs and coping behaviours: perceived illness *timeline* and perceived *treatment control* with physical activity, perceived illness *timeline* with fruit and vegetable intake, fibre intake and sugar intake. In addition, fibre intake was associated with perceived illness *consequences*. Perceived illness *identity* was positively correlated with BMI and insulin status, and perceived personal control with duration of diabetes.

Searle *et al*. (2007) further conducted a regression analysis to predict coping cognitions and coping behaviours using illness beliefs by controlling socio-demographic and clinical variables. They found that nearly a quarter (26%) of coping cognitions were explained by both perceived illness *identity* and perceived *emotional representations*. This result indicated how diabetes affects a person's life, how it affects their emotions, and explains some part of coping cognitions. Different illness beliefs were able to predict different coping behaviours. Furthermore, perceived *treatment control* explained 17 percent of medication adherence; perceived *consequences* explained fibre intake by 21 percent; and perceived *timeline* explained sugar intake by 12 percent. Socio-demographic and clinical characteristics were also able to predict coping behaviours when entered separately from illness beliefs in the analysis. They also found that duration of diabetes explained *confrontational* coping by 30 percent; age and BMI explained exercise by 14 percent; and age alone was able to explained carbohydrate intake. In addition, together, gender and perceived illness *timeline* predicted fruit and vegetable intake by 21 percent.

Other than these findings, this study highlighted that they found no significant relationship between coping strategies and coping behaviours, suggesting that it is possible that when choosing a particular behaviour, coping strategies do not play a part. Another explanation may be that it is possible that the coping measurement only measures a static state of coping behaviours. Therefore, they concluded that coping strategies did not mediate the relationship between illness beliefs and coping behaviours. However, they found that there was no significant relationship between coping cognitions and coping behaviours, which suggested that coping cognitions and behaviours were operating independently.

A study of heart attack survivors, examining how approach-avoidance coping and illness perception in Icelandic patients related to their HRQOL, found that less use of avoidance coping resulted in increased psychological, social, and physical

quality of life (Bell-Duijndam, 2004). In this study, those using avoidance-coping perceived their illness as more life-threatening than patients who used approach-coping strategies.

There have been many studies in support of the CSM. For example, Hagger and Orbell (2003) conducted a meta-analysis on 45 studies using the CSM. They concluded that there was a positive correlation between the identity, serious consequences, and timeline dimensions. Furthermore, personal control of the illness has been related to fewer reported symptoms, less serious consequences, as well as a worse acute timeline.

In studies on people with irritable bowel syndrome, Rutter and Rutter (2002) examined relationships between illness beliefs, coping and outcome. Measurement of illness beliefs was the original IPQ (Weinman, Petrie, Moss-Morris, & Horne) without the identity scales and full version of COPE (Carver, Scheier, & Weintraub, 1989) to measure coping. Outcome was measured in several ways: selected items of WHOQOL (WHOQOL Group, 1998), anxiety and depression using The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Rutter and Rutter tested whether the relationship between illness beliefs and outcome were mediated by coping strategies. Those who perceived less illness consequences and felt more control of their illness had a better HRQOL. Furthermore, *acceptance* coping was found to mediate the effect of illness *consequences* suggesting that people with fewer illness *consequences* were more likely to accept their illness than those who perceived more *consequences*. Together, these components were included in their model and they explained more than a third of the variance in the outcome.

A thorough study using the IPQ-R (Moss-Morris *et al*., 2002) and the Utrecht Coping List (Schreurs, Van de Willege, Brosschot, Tellegen, & Graus, 1993) on patients with three chronic diseases; rheumatoid arthritis, chronic pulmonary

disease, and psoriasis by Scharloo *et al*. (1998), led to the conclusion that the higher score in illness *identity*, passive coping, belief in a long illness duration, belief in severe *consequences*, and an unfavourable score on medical variables, related to poorer HRQOL. This was shown in lower scores on disease-specific measures of functioning and on general role and social functioning. Seeking social support and beliefs about *controllability/curability* of the disease were significantly related to better daily functioning. Importantly, the study contradicts the CSM since it does not support the idea that coping is a mediating factor between illness beliefs and outcome. They concluded that illness beliefs seemed to affect functioning directly. A similar result was also reported in an earlier study (Moss-Morris *et al*., 1996).

4.5 Cultural influences on the common-sense model of self-regulation

Within the CSM, behaviour is determined by internal, personal factors. However, this strong emphasis on the individual may not be so apparent in collectivist cultures. Collectivist cultures perceive individual behaviour as a product of communal expectations. Collectivism, as a connectedness in relation to others, is a priority in many Asian and African cultures. Also, women are more collective by nature compared with men. There are, however, intra-ethnic and intra-gender differences. Collectivist perspectives believe in uniting with others as an important value, more so than relying on internal resources. Individuals are defined and their behaviours are influenced by their role in society (Jackson, MacKenzie & Hobfoll, 2004). Emotional representations associated with illness are influenced by cultural values and belief systems. They can change illness experiences, coping responses, and other aspects of illness self-regulation (Bauman, 2003).

In relation to power inequality, Jackson *et al*. (2000) also argue that self-regulation assumes that individuals have a relatively equal amount of control in their society. However, there are different roles within a society with different degrees of power. Individuals who possess a limited share of power may be capable of self-regulation, but are prevented from exercising it by external circumstances. They also add that self-regulation naively assumes that everyone has the same access to resources, such as power, money, and support, when fulfilling their goal and coping with their distress. This is, of course, not always the case. There is an inequality of power, which poses more obstacles for those who have limited access of power, but those who have privileged social status tend to have more sense of personal efficacy since they have more control over their environment, as well as available resources to achieve their desired goals. Based on this, they conclude that the context and access to resources must be considered when studying a goal-directed behaviour. They also suggest that pain in the CSM is internal, mentally mediated, and personally controllable.

Culture also may have an influence on how an individual approaches a goal. Based on the hedonic principle, regulatory focus theory assumes that people can either be pleasure-seekers or pain-avoiders. Pleasure-seeking individuals tend to be regulated by a promotion focus, while pain-avoiding individuals by prevention focus (Higgins, 1997). A study by Lockwood, Marshall and Sneller (2005) found a difference in perceptions of positive and negative role models. By studying a sample of Canadian-Whites and Canadian East-Asians, they concluded that people with Western beliefs were more likely to be self-regulated with promotion goals, whereas Eastern beliefs were associated with prevention goals. In another study, Miller and Markman (2007) measured eighty-three introductory psychology students. Most were females (77%) with a mean age of 18.5 years. Participants were asked to fill out the Beck Depression Inventory II, which is a self-report questionnaire on depressive symptoms. Those selected were contacted by phone

at approximately 1.5 months post-screening. They were invited to participate in a study entitled 'Thinking about Past Events. The inventory was re-administered during this time. Participants were asked to recall a recent negative academic outcome. They reported that lack of promotion-focus mediates the negative relationship between degree of helplessness depressive symptoms and motivation/performance outcomes. Therefore, prevention focus, which is related to negative affect and has been found to be more salient in Eastern culture, may contribute to helplessness depressive symptoms. Helplessness depressive symptoms have been related to worsened HRQOL. Eastern culture is associated with having negative affect and regulating their motivation with prevention (Lockwood *et al*., 2005).

There are several factors that differentiate a promotion focus from a prevention focus: (1) promotion focused people have stronger needs for growth, development and nurturance, whereas the needs for safety, protection, and security is stronger in prevention focused people; (2) promotion focused people refer to their ideal selves (hopes, wishes, and aspirations) as the standards, resulting in greater cheerfulness; whereas prevention focused people rely on their ought selves (duties, obligations, and responsibilities) which generate agitation responses; and (3) promotion focused people would have an approach motivation, with increased expectancies following feedback which indicates success because they value reaching goals; while the prevention focused person would have an avoidance motivation bias, with decreasing expectancies following failure feedback because they value correct rejections. This means, promotion focused people have more sensitivity to the presence or absence of positive outcomes, and this hope of success results in approach behaviours. In terms of experienced value, on the one hand, promotion focused people would see an outcome as pleasure. On the other hand, the prevention focused people would have more sensitivity toward the absence or presence of negative outcomes, and this fear of failure would result in avoidance

behaviours. They experience outcome as pain (Bagozzi, Dholakia & Basuroy, 2003; Freitas, Liberman, Salovey & Higgins, 2002; Forster, Grant, Idson & Higgins, 2001; Liberman, Molden, Idson & Higgins, 2000; Higgins, 1997; Higgins, Shah, & Friedman, 1997). Brockner *et al*. (2002) explain that people with promotion focus have standards reflecting wishes and aspirations because they tend to bring their actual self to the ideal self. On the other hand, prevention focus people prefer to bring their actual self to the ought self, and therefore reflecting duties and obligations.

However, in a small qualitative study of British-Whites and British South-Asian groups, Beshion and Nazroo (1997) found that age, and not ethnicity, determined the type of control linked to health behaviours. Older people tended to link external control to health compared with younger ones.

The CSM has been used widely to study health-related behaviour in the past two decades. Based on this model, it can be seen that heart attack survivors almost instantly create cognitive and emotional representations of their heart condition. They soon form specific illness beliefs and attempt to cope with the resulting arisen.

4.6 Measuring illness representations

Individuals often choose not to discuss their thoughts about their illness during medical consultations. They are usually afraid that these beliefs are wrong. Therefore their cognitive models of their illness are kept private. The perception of a particular illness may derive from previous knowledge and impressions from the past. The source may be the media, the illness of a family member, or information from friends and relatives. These cognitions may lie dormant before

being activated when the individual or someone close to them suffers this illness (www.uib.no/ipq, retrieved in 2009).

Prior to the development of the measurement of illness beliefs, there were many methods for measuring illness representations. Leventhal and Nerenz (1985) used in-depth interviews focusing on the illness experience. Other measurements have been developed for similar purposes but some of them are lacking in a theoretical base (e.g. Prohaska, Leventhal, Leventhal & Keller, 1985).

The original Illness Perception Questionnaire (IPQ) was developed by Moss-Morris *et al*. (1997) to measure cognitive and emotional representations of illness. They decided to generate a tool to measure people's representations of illness which is theoretically-driven and psychometrically sound, as well as flexible to suit different health threats or contexts.

The IPQ has become a popular tool. The development of the original version of the IPQ, which was later revised to the Illness Perceptions Questionnaire-Revised (IPQ-R), has generated a great deal of interest in the study of illness representations and the CSM. Serving its purpose, the IPQ has been used with various chronically-ill populations, which include CHD (Cameron, Petrie, Ellis, Buick, & Weinman, 2005a; Cameron *et al*., 2005c; Frostholm *et al*., 2005; Fiegueras & Weinman, 2003; Hirani, Pugsley & Newman, 2006; Moss-Morris, Petrie & Weinman, 2002), cancer patients (Cameron *et al*., 2005b; Moss-Morris *et al*., 2002; Scharloo *et al*., 2005), rheumatoid arthritis (Carlisle, John, Fife-schaw, & Lloyd, 2005; Moss-Morris *et al*., 2002), type 2 diabetes (Broadbent, Petrie, Main, & Weinman, 2006; Moss-Morris *et al*., 2002; Searle, Norman, Thompson, & Vedhara, 2007), chronic fatigue syndrome (Moss-Morris, Petrie, & Weinman, 1996; Scharloo *et al*., 1998), irritable bowel syndrome (Rutter & Rutter, 2002), chronic obstructive pulmonary disease (Scharloo *et al*., 1998), psoriasis (Scharloo *et al*., 1998) and Addison's disease (Heijmans, 1999).

The IPQ and the revised version are easy to use and easily applied to different illnesses without damaging its psychometric qualities. The development of the shorter version of this questionnaire (Broadbent *et al*., 2006) is even simpler to administer and consumes less time. Although it has been published only in the past four years, it has proven to be a popular tool to measure illness beliefs.

Over the years, the IPQ has been used in research in different countries and translated into many languages. It has been employed with a British sample during its first development (Moss-Morris *et al*., 2002), a Dutch sample (Heijmans, 1999; Scharloo *et al*., 1998) and New Zealanders (Broadbent *et al*., 2006). The original IPQ is available in French, Italian, Norwegian, Romanian, Samoan, Sri Lankan and Tongan. The revised version has been adapted to Chinese, Dutch, French, German, Greek, Hebrew, Italian, Icelandic, Norwegian, Persian, Portuguese, Slovenian, Spanish, Swedish and Turkish. In addition the latest short version, Brief-Illness Perception Questionnaire (B-IPQ) is available in the above languages as well as Danish, Gujarati, Hindi, Italian, Japanese, Persian, Polish, Russian, and Thai. These versions can be found in the IPQ website, www.uib.no/ipq/.

There are some correlations within these components of illness perception; the controllable or curable illness component is associated with perceived shorter illness duration, and minor consequences; and an illness perceived as more permanent having more consequences and the perception that illness is difficult to control and cure (www.uib.no/ipq, retrieved in 2009). This means, when individuals believe that their disease can be controlled and they can recover from it, they also believe that this disease will be short-term and have a little impact on their life. On the contrary, when a disease is perceived to be long-term and has many symptoms, then they will think it will be difficult to recover from it.

Although the original IPQ was widely accepted, Moss-Morris *et al*. (2002) later revised this version. They found that the original IPQ showed a psychometric problem and also there was a need to modify one of the subscales. The IPQ-R included more items in the control/cure and timeline scales and this resulted in better internal reliability. When tested on people with renal disease and rheumatoid arthritis, they found that each subscale had a high reliability, ranging from .79 to .89. They also report that the test-retest reliability shows a good consistency over a three-week and six-month period. More subscales which include cyclical timeline perceptions, illness coherence, and emotional representations were added. The IPQ-R scale consists of one item for each of these subscales: (1) perceived *consequences* ("how much does your illness affect your life"), (2) perceived *timeline* ("how long do you think your illness will continue"), (3) perceived *personal control* ("how much control do you feel you have over your illness"), (4) perceived *treatment control* ("how much do you think your treatment can help your illness"), (5) perceived *identity* ("how much do you experience symptoms of your illness"), (6) perceived *concern* ("how concerned are you about your illness"), (7) perceived *understanding* ("how well do you think you understand about your illness"), and (8) perceived *emotional representations* ("how much does your illness affect you emotionally"). The identity subscale consists of 17 questions, 30 questions for the rest of subscales, and 18 questions about the causes. Other than the identity subscale, which comprises yes-or-no options, the rest of the questions are measured in a five-point Likert scale from 0 (agree) to 5 (disagree).

With over 80 items, the IPQ-R has the disadvantage of being an exhausting measure, particularly for very ill patients and/or when there is a limited time to conduct the research. Hence, a shorter version was needed. With only nine items, the B-IPQ (Broadbent *et al*., 2006) was introduced to offer less time consuming measurement. Each scale is measured by only one item. Each of these items is

measured on a Likert-scale of 0 to 10. The scoring is straightforward as increases in the scale measured are indicated by increases in item scores. In addition, there is an open-ended question asking about the perceived cause of illness with up to three responses. Broadbent *et al*. (2006) conclude that after three months, the B-IPQ shows good test-retest reliability. Moreover, when compared with the IPQ-R version, it shows good to moderate correlations on all scales.

The IPQ was designed to measure the representations of illness from the point of view of individual suffering from the disease. However, it does not specifically measure the element of coping. There are readily available tools to measure coping separately which were available prior to the development of the IPQ.

4.7 Measuring coping

There are generally two views of coping measurement; coping as a personality characteristic and coping as a process of adaptation to situational context (Lazarus, 1983). Due to its psychoanalytical nature, hierarchical styles of coping measure coping as trait measures, where coping is seen as generally consistent over time. This is contrary to the process perspectives where coping is seen as changing over time adapting to the situational contexts in which it takes place. In the latter view, coping is not defined as universally adaptive versus maladaptive, though some might often be better or worse than others (Lazarus, 1983).

Both of these views have their own limitations. Coping style cannot adequately explain or predict intra-individual differences in the face of stress within specific context. The limitation of measuring coping as a process is that it cannot see a person as a whole who has a goal hierarchy, and situational intentions, belief systems, and social connections. Lazarus (1983) concluded that both of these approaches are essential because they supplement each other.

Most of the widely available measurements of coping emphasise coping style. For example, the Jalowiec Coping Scale which is briefly explained in Chapter One, and the two most popular coping scales are, Ways of Coping (Folkman *et al*., 1986) and the COPE Inventory (Carver, Scheier, & Weintraub, 1989).

The Ways of Coping, created by Folkman and Lazarus (1980), divides coping style into problem-focused and emotion-focused coping. Problem-focused coping involves changing the source of stress, whereas emotion-focused coping concentrates on lowering the emotional distress associated with the situation. This measurement was later criticised for not accommodating enough coping strategies (Carver *et al*., 1989).

The COPE Inventory is a reliable scale to assess coping strategies (Clark, Bormann, Cropanzo, & James, 1995). The COPE Inventory is theoretically-driven, has standardised scoring procedures, and is widely used due to its constant set of scales and items (Carver *et al*., 1989). It consists of five scales relating to problem-focused coping (*active coping*, *planning*, *suppression of competing activities*, *restraint coping*, and *seeking instrumental social support*); another five relating to emotion-focused coping (*seeking emotional social support*, *positive reinterpretation*, *acceptance*, *denial*, and *turning to religion*); three scales from coping strategies (*focus on venting of emotion*, *mental disengagement* and *behavioural disengagement*); and *substance disengagement* (Carver *et al*., 1989).

The Brief-COPE (Carver, 1997) is the simplified version of the COPE Inventory. It was created to provide a less time consuming measure of coping strategies. This short version removed two scales of the COPE Inventory, as well as reducing the rest of the items for each scale, with the addition of one scale. As a comparison, Carver *et al*. (1989) created the COPE Inventory consisting of 60 items, which are 15 items divided in four scales to measure coping strategies. The shorter version

contains only 28 items for two scales, Brief-COPE (Carver, 1997), compared with 66 items in the Ways of Coping.

There were some alterations in the shorter version. The *restraint coping* and *suppression of competing activities* coping were removed from the full COPE. *Restraint coping* was removed since it was not proven to have any added value and *the suppression of competing activities* coping scale was removed because its properties were similar to *active coping* scale. Three other scales were renamed: *positive reinterpretation and growth* coping was changed to *positive reframing* coping; *focus and venting on emotions* coping became *venting* coping; and *mental disengagement* coping became *self-distraction* coping which focused more on doing activities to take the mind off the stress. Furthermore, each scale was reduced to only two items, compared with four items in the full version. In addition, one new scale, *self-blaming*, was introduced. There are a total of 14 scales in the B-COPE (Carver *et al.*, 1989): (1) *active coping*, (2) *planning*, (3) *positive reframing*, (4) *acceptance*, (5) *humour*, (6) *spiritual*, (7) *using emotional support*, (8) *using instrumental support*, (9) *self-distraction*, (10) *denial*, (11) *venting*, (12) *substance use*, (13) *behavioural disengagement*, and (14) *self-blame*. *Active coping* is using active measures to remove the stressor or to reduce its effects. This is similar to problem-focused coping proposed by Lazarus and Folkman (1980). It includes initiating direct action, increasing efforts, and trying to execute a coping strategy. *Planning* coping involves the thinking about how to cope with a stressor by using action strategies, thinking about steps to take and how to handle the problem. *Positive reframing* is relating to action of redefining a stressful transaction in positive way and therefore makes the individual continue active, problem-focused coping actions. *Acceptance* is accepting the reality of a stressful situation, whereby the stressor is seen as something to accommodate and not easily changed. Using *humour* is *a priori* scale that has been found to reveal a distinctive factor in the analysis of the full COPE Inventory (Carver *et al.*, 1989)

and Brief-COPE (Carver, 1997). Using *humour* to cope was found to be related to coping in people with Openness personality trait (McCrae & Costa, 1986). Openness personality trait people are characterised with curiosity to new things, art and emotion. *Spiritual* coping also reveals a distinctive factor (Carver, 1997; Carver *et al.*, 1989). There are many reasons for an individual to turn to religion in the face of stress: (1) as a source of emotional support, (2) for positive reinterpretation and growth, and (3) as an active coping strategy. *Spiritual* coping may appear as the performance of religious activities, yet it extends to the meaning or significance the behaviour holds for the individual, and this is often overlooked when assessing coping strategies (Ellerhorst-Ryan, 1996). Carver *et al*. (1989) chose this type of coping as a single scale that assessed the tendency to turn to religion during stress. *Using emotional support* coping is basically looking for moral support, sympathy, or understanding from other people, and *using instrumental support* coping is defined as looking for advice, assistance, or information from others. The ninth coping type is *self-distraction* coping. It defines as letting oneself be distracted from dealing with the stressor itself. *Denial* coping is used when the individuals holding themselves back; acting prematurely. This type of coping is both active and passive coping. It is an active coping strategy because the person is focused on dealing with the stressor, and at the same time passive through also choosing not to act on it. *Venting* coping is when an individual focuses on the distress and ventilates those feelings. This may distract the individual from performing an active coping strategy. *Substance use* coping is another *a priori* scale that was found to be a stand-alone factor in both the original COPE Inventory (Carver *et al*., 1989) and the Brief-COPE (Carver, 1997). Principal component analysis in the Brief-COPE reveals very high Cronbach's alpha correlations of .90 between its two items (Carver, 1997). *Behavioural disengagement* coping is also one of the *a priori* scales that revealed as its own factor in both COPE scales (Carver 1997; Carver *et al*., 1989). It defines as reducing one's effort in dealing with the stressor, which includes giving up the

effort to reach goals when a stressor is interfering. This type of coping usually occurs when a poor coping outcome is expected. Finally, *self-blame* scale was later added to the Brief-COPE following a finding from McCrae and Costa (1980). They found that *self-blame* coping has been found to be related to emotional instability (neuroticism) personality trait. People with this personality trait are more prone to negative emotions.

The psychometric properties of the brief version are slightly improved compared with the full version. The internal reliability of the 14 scales, other than *venting* (.50), *denial* (.54) and *acceptance* (.57), are mostly good (.64 to .73). Two of the scales, *spiritual* coping (.82) and *substance use* (.90) have very good properties (Carver, 1997). The Brief-COPE therefore has improved its internal reliability compared to the full-COPE Inventory version which has reliability values ranging from .48 to .86 (Carver *et al*., 1989). Furthermore, compared with the Ways of Coping, the COPE scale can explain more variance in the outcome measure (Clark *et al*., 1995).

4.7.1 *Critics on the measurements of coping*

Coyne and Gottlieb (1996) also criticise the checklist measurement of coping. This is a self-report method and easy to administer, and therefore is a widely used method of measuring different ways of coping. Coyne and Gottlieb pose several criticisms mainly by understanding how respondents interpret the items. They note several dilemmas faced by respondents when using a checklist measurement. Coyne and Gottlieb identify three dilemmas: the imposed narrative; selecting the stressor on which to report; and deciding which items to endorse.

The first dilemma is revealed after studies using imposed narrative. In imposed narratives, respondents provide their own narratives of stressful episodes before responding to a coping checklist and compare this with the checklist response.

This has shown that the structure imposed by a checklist measurement is only applicable to some people some of the time. A coping questionnaire may force people to choose a coping strategy because often in the face of a stressful event, individuals may not make an appraisal of what is at stake, review the kind of resources they have, and what they are trying to do. A stressor does not necessarily become the immediate focus, as sometimes a stressor can be ignored in a situation where the goal is to persist in an activity that is made more difficult by the stressor. Coping theory generalises about people involved in stressful situations as people may not think about what they are trying to accomplish.

The second dilemma posed by Coyne and Gottlieb, is due to the instruction to initially select a stressor to report. A specific stressful event is selected at the beginning and respondents must focus on this event when responding to the checklist. The instruction, for example, can be to select an event that is the most stressful during a specific period of time, to describe how they cope with a key stressful event. This process can be subjectively dependent on how each individual interprets this task. If the instruction is too general, then respondents will refer to a variety of past stressful events when completing the checklist. On the other hand, respondents will not have experienced particular classes of stressor to complete the checklist, when the instruction is too narrow. Different classes of stressors will elicit different coping strategies. There are assumptions that all respondents have actually encountered the event under study and have engaged in an effortful coping, and that the stressor has roughly equivalent meaning to all respondents. The differences in subjective interpretation generate several issues. First, there is the issue of conformity to the investigators' notion of coping. Second, a specific stressful event can generate distress in a different way to different respondents and this can pose a threat to the differences in the effectiveness of the strategies engaged in coping with this event. And finally, the investigator should aim not only at the respondents' subjective appraisal of the

specific events, but also key features of their context in obtaining detailed information.

There is another issue with the period of time indicated in the instruction at the beginning of the checklist measurement. Some instructions may allow for the previous two weeks, a month and some even longer. Coyne and Gottlieb argue that the longer the period of time given, the more error will be introduced. There is bias in favour of events that are considered to be extraordinary and may not represent how respondents typically cope with stress. Furthermore, the effectiveness of problem-focused coping may influence judgment of events to be less stressful. For this reason, it will not be reported. The reason is because individuals may not be able to recall the detail of specific thoughts and behaviours prior to the decision of to employ specific coping strategies after weeks or months, or even after days have passed.

The final dilemma in coping checklist measurements is in deciding which item to endorse. Coyne and Gottlieb raised three sets of issues within this dilemma. The first set of issues is that the items in the measurement of coping are usually not clearly worded with little reference to the specific character or the context to which coping was employed. This is usually intended to ensure that these items will be broadly applicable. However, respondents may not be able to relate this item to their own coping efforts. Another issue when deciding which item to endorse, respondents may endorse the presented coping items because they recognise themselves in these items. They recognise themselves in these items because of a valued orientation to coping or their personal disposition, such as optimism, but not necessarily reflecting the particular stressful event that had taken place weeks or months ago. In fact, some of the items refer to daily living activities, for example item 7 in the COPE Scale ("I've been making jokes about it") or item 10 ("I've been getting help and advice from other people"), that it is difficult to differentiate what strategies they used in one stressful situation or the

other. Coyne and Gottlieb conclude after examining many items that they are assessing cross-situational styles, instead of assessing thoughts processes or actions that occurred at the time of a particular stressful event.

The second set of issues relates to the social desirability effect and self-presentation. The first issue is that the instructions of coping checklist measurements and some of the phrasing of some of the items may convey expectations of desirable response. For example, in Brief-COPE items such as item 12 ("I've been saying to myself that "this isn't real"). The next issue is the use of word "trying" or "to try" in many of items in the coping checklist measurements. This may imply an ideal situation and may appeal to the respondents who wish to please and to appear in a good light. Five out of 28 items in Brief-COPE contain this word. For example, item 12 ("I've been trying to see in a different light, to make it seem more positive"), and item 7 ("I've been taking action to try to make the situation better"). Some items in the coping checklist measurement may also culturally suggest a direction to choose, or to avoid appearing to cope ineffectively. For example, item 4 ("I've been using alcohol or other drugs to make myself feel better") and item 11 ("I've been using alcohol or other drugs to help me get through it") in the Brief-COPE. Since the media is currently highlighting the side effects of alcohol and heavy drinking in British society, these items may not be able to reflect the actual coping adopted. For people living in Eastern cultures, two items measuring spiritual coping, "I've been trying to find comfort in religion or spiritual beliefs" and "I've been praying or meditating", pose a similar problem. Gottlieb and Gignac (1996) also argue that the nature of generic coping questionnaires, dismiss the richness and domain specificity of coping.

The final set of issues concerns the reference to outcomes instead of coping strategies in the items, or describing both outcome and a coping strategy. For example, item 1 ("I've been turning to work or other activities to take my mind off

things"), or item 7 ("I've been taking action to try to make the situation better"). Coyne and Gottlieb argue that coping method content or commitment to its goal will serve as a basis to whether or not to endorse such items.

In addition, Coyne and Gottlieb also put an emphasis on interpreting coping scale scores. They suggest that the lack of progress in the study of coping is due to the inability to provide precise and meaningful interpretations of coping scale scores. The general conclusion is to conclude that higher scores are more likely to adopt some thought or behaviour that is representative of a particular coping strategy than people with lower scores. However, Coyne and Gottlieb point out other possibilities: (1) higher scores often indicate that respondents actually employed a greater number of different coping strategies, or they have used these strategies more often or with greater effort, (2) higher scores may indicate that the stressful events encountered were either prolonged or less changeable to the respondent's effort, (3) higher scores could reflect greater appropriateness or relevance of particular items to the stressors encountered, and (4) identical scores could be achieved by using very different kinds of thoughts and action and employing these for completely different reasons. These interpretations will vary depending on studies and the circumstances in which data were collected. This ambiguity may partly explain the lack of relationship between coping and adaptational outcomes in many studies. Therefore, Coyne and Gottlieb suggest that researchers should be more critical in interpreting relative differences in scores.

Coyne and Gottlieb (1996) conclude that:

> "…coping checklists are grounded in too narrow a conception of coping to capture the full range of thoughts and actions that mediate between potential sources of stress and adaptational outcomes; that application and interpretation of checklists in a typical study is not faithful to a transactional model of stress and coping; that a number of psychological

> factors intervene between what occurs in naturalistic settings and what is reported on coping checklists; and that no consistent interpretation can be assigned to coping scale scores." (p. 984)

They suggested that the best way to measure coping is by including a qualitative interview. For example, Gottlieb and Gignac (1996) and Gignac and Gottlieb (1996) found that Ways of Coping Checklist only managed to identify two coping strategies from 17 which they encountered in the family caregivers of people with dementia. They use a mixed of qualitative and checklist measurements. In the qualitative interview procedure, they began with identifying stressors by asking symptom of a stressor in the form of "most upsetting these days" by rating 18 items on the Memory and Behaviour Checklist in terms of its occurrence (yes/no), three-scale of duration ("less than six months", "six months to a year", "a year or longer"), five-scale frequency ("less than once a month", "once or twice a month", and so on), and the seven-scale amount of upset it created ("not upset" to "very upset"). They then ask "…anything that you valued or that you had looked forward to which you have had to give up". They followed by probing five of their coping strategies with five questions based on cognitive coping, emotion-focused coping, support-seeking, escape/avoidance coping and problem-focused coping. They analysed the content of this interview and found 53 coping categories.

Their coping scheme also enriches and adds diversity to the dimensions tapped by generic coping instruments. For example, only two items in the Ways of Coping Checklist touch on any of the 17 coping efforts subsumed within the verbal and behavioural symptom management classes, one tapping the expression of anger toward the perpetrator of the problem and one tapping efforts to persuade the "person responsible" to change his or her mind. In omitting many of these specific coping efforts, a generic inventory may underestimate the extent of problem-centred coping elicited by the most upsetting symptom. As a result, outcome

predictions made from generic instruments may be less powerful because potentially influential coping efforts would be missing.

4.8 Conclusion

The CSM emphasises the dynamics of the information processing system in reaching (health) goals. The model is based on self-regulation, which is a goal-striving and goal-attainment process. There are two important arms in the CSM. Cognitive processes activate and develop illness beliefs and the emotional processes involves in reducing anxiety and fear. Self-regulating behaviours improve self-determination and control of HRQOL (Leventhal, Meyer, & Nerenz, 1980).

Although emphasising on the 'self' and tend to focus on internal processes and mechanisms, the socio-cultural context where these processes occur are also take into account, as well as knowledge structures of illnesses, health and treatment methods that reflect experiences within family, community and society (Jackson MacKenzie, & Hobfoll, 2000).

Many tools to measure the components in the CSM have been developed over the years. Illness beliefs are commonly measured using the IPQ. The present study will use the shorter version, the B-IPQ. In measuring coping, there are many coping checklists available to use, although there have been issues raised regarding the reliability of this method. This study seeks to establish the coping role within the CSM using short version of COPE scale. Not only does the Brief-COPE have fewer items compared with Ways of Coping, it also has more scales, including spiritual coping, and can explain more variance of the outcome measure.

The CSM had been widely researched. There is some evidence that certain aspects of illness representations can predict HRQOL. However, the role of

coping is undetected in previous studies, and it has been abandoned in later research. This study will examine the CSM in Eastern culture, and compare it with Western. Therefore, the role of coping in this culture will be explored further.

It is important to see how illness beliefs and coping styles are shaped by environmental and cultural factors surrounding the individual. Beliefs about the illness, patients' cognitive processes in handling the disease itself and the consequences of the disease are highly affected by environmental and cultural factors. People in the Western countries could have different ways of thinking compared with patients from Eastern countries, and this might also apply to people from different minority ethnic groups within a country.

The following chapter explores HRQOL, including its measurement.

CHAPTER 5 MEASUREMENT OF HEALTH-RELATED QUALITY OF LIFE

5.1 Introduction

In the past, returning to work or emotional dimensions were often used as outcome measures following MI. Recently, HRQOL have become the common outcome measure as many people with MI may not have to return to work, for example, full-time housewives, retired people. This chapter discusses HRQOL and its measurement.

5.2 Defining health-related quality of life

Having a heart attack is a life changing experience and will generally affect the individual's HRQOL. The period of the first month following the event is a debilitating experience, both physically and emotionally (Daly, Elliot, Cameron-Traub, Salamonson, Davidson & Jackson, 2000). HRQOL is a well researched concept and there are many definitions. A definition proposed by Höfer, Lim, Guyatt and Oldridge (2004) is:

> "…individuals' perspectives of the impact of their disease on overall physical, emotional, and social well-being, taking into account both the individual's functional status and their perceptions of the dimensions measured of health-related quality of life." (p.2).

Taking into account cardiovascular disease, Wenger *et al*. (1996) propose a similar definition of HRQOL:

> "Health-related quality of life concerns those attributes valued by patients, including their resultant comfort or sense of well-being; the extent to which they are able to maintain reasonable physical, emotional, intellectual function; and the degree to which they retain their ability to participate in valued activities within the family, in the workplace, and in the community." (p.884).

This current study used the definition of HRQOL by Höfer *et al*. (2004) as it is including perceptions of the dimensions of HRQOL.

HRQOL comprises mainly psychosocial aspects. For example, the emotional aspect is related to how someone will cope with their disease (discussed further in Chapter Four). It has been shown that those with more symptoms and those who believe that their disease is life-threatening, have a lower HRQOL (His, Chen, & Lee, 1990; Bosworth, Steinhauser, Orr, Lindquist, Grambouw & Oddone, 2004). After the experience of a heart attack, it has been reported that some people find that their spouses become overprotective and controlling about diet, exercise, rest or sexual activities. These behaviours may impair their relationship (Fallowfield, 1991).

The following section explains the measurement of dimensions of HRQOL.

5.3 Measurement of health-related quality of life

Depending on the population being studied, the type and severity of the illness and the type of interventions, where appropriate, most aspects of HRQOL are covered in the available assessment instruments. These include physical, psychological and social functioning, role activities, perceived life satisfaction, perceptions of individuals' health status, cognitive functioning, personal productivity, sleep disturbance, pain and other symptoms, as well as intimacy and sexual functioning

(Wenger *et al*., 1996). Not only is the individual affected by illness, but so too are the family and/or close friends. They may in turn affect the individual's health status through the degree of their emotional reactions to the person who just had a heart attack, and the degree of support provided (Shumaker & Hill, 1991).

There has been much cardiovascular research in the past that has focused on return to work as an outcome for HRQOL. Wenger *et al*. (1996) argued that this may not be an appropriate outcome when measuring HRQOL. They further argued that, even if considered as one aspect of HRQOL, return to work may not be a reasonable goal considering that the work role also consists of other components such as job satisfaction, job performance, opportunities for promotion, and the adequacy of income. Additionally, there were also general aspects of work which include employment history, job category and skill level, the number of unemployed people within the particular community where the individual lives, financial status, and the perceptions of employer, colleagues and the individual regarding disease-related limitations. The definition of work was also questionable, as it may not be possible for the elderly to return to work, or women with household and caregiving roles, or when the individual is severely impaired. For these reasons, return to work cannot replace global HRQOL as an outcome measure.

HRQOL measurements can serve as (1) a basic classification to characterise individuals into different categories, (2) a means of predicting future clinical outcomes, and (3) a secondary descriptive outcome variable that gives multidimensional information, such as emotional functioning, as opposed to relying only on clinical end points (Sugano & McElwee, 1996).

Several potential biases arise when assessing HRQOL, namely (1) confounding bias which can be minimised by randomisation, reducing participant variability and large sample size, and (2) both expectancy effect and demand characteristics

can be minimised by the 'double blind' technique where neither investigator nor participants know about the treatment they are receiving. This can be difficult as both can sometimes accurately recognise the characteristic outcome being measured (Sugano & McElwee, 1996).

Sugano and McElwee (1996) also raise some issues regarding HRQOL as a main outcome. First, there is an issue of generalisability to a broader context than just the individuals with the specific illness category being measured. These types of illness-specific measures usually have good internal reliability, as opposed to generic measures, which have better generalisability but low internal reliability. Second, newer multidimensional measurements are based on robust theoretical constructs, and therefore rely upon the psychometric properties of convergent and discriminant validity across different dimensions, as opposed to criterion validity against clinical variables. This is difficult to achieve in psychological or behavioural domains when measuring the gradient of recovery as in defining those who improve and those who do not is less clear compared with physical domain measures. Thus a measurement can be statistically significant, but may not be clinically interpretable.

Swenson and Clinch (2000) conclude several things about interpretation and limitations of HRQOL assessment: (1) HRQOL may reflect changes in medical procedures and medications; (2) it is related to age, gender, ethnicity, severity of disease, types of treatment, etc and therefore it should focus on specific groups of patients and disease characteristics; (3) short-term outcomes should be distinguished from long-term outcomes; (4) it is good to compare a HRQOL score with the general population of non-patients, and; (5) it is influenced by socio-economic level, health care systems and culture. For this reason, studies from different regions or countries should not be generalised to other populations.

5.4 Psychometric properties of health-related quality of life measurements

5.4.1 *Factor analysis*

In factor analysis, items with high correlation coefficients are grouped together as a domain (Juniper, Guyatt & Jeschke, 1996). Other than grouping the similar items together, domains can also be classified based on common sense and clinical experience (Juniper *et al*., 1996). On the one hand, the statistical approach is the most popular and practical method but may pose a problem due to counterintuitive groupings and may end up with lack of sense of direction on how to proceed; on the other hand, using common sense and clinical experience may rely on intuition which is subjective (Juniper *et al*., 1996).

5.4.2 *Reliability*

Reliability refers to consistency in measuring the signal, differences between individuals at a point in time, and the noise, differences within the same individual at different times (Juniper *et al*., 1996). Reliability is most likely to be measured statistically, as an interclass correlation coefficient that relates the variance between-subject to its total variance. The intraclass correlation will increase as the variability between subject increases, and decrease with differences between scores on the original and subsequent administrations (Juniper *et al*., 1996).

5.4.3 *Validity*

Validity poses the question of whether the instrument is actually measuring what it is intended to measure. It can measure in relation to a clinical standard (criterion validity), or no clinical standard (construct validity). Discriminant validity can be established by comparing the instrument with other instruments at the same time, whereas construct validity can be established by comparing measures, and

examining the relationship that should exist between a measure and characteristics of patients and patient groups (Guyatt, Jaeschke, Feeny & Patrick, 1996; Juniper, Guyatt & Jaeschke, 1996).

5.4.4 *Responsiveness*

A good measure should be able to detect changes in health status no matter how subtle those changes may be. These changes may result from an intervention or treatment, or spontaneously. Responsiveness can be measured by using a paired *t*-test to measure whether there are changes in the respondent's health status, or an independent *t*-test to measure patients who change compared with those who do not change (Juniper *et al*., 1996). The responsiveness of the measures in this study is discussed in detail in Chapter Seven and Chapter Eight.

5.5 Types of quality of life measurements

There are two broad types of measurements, (1) general ones that measure ranges of populations and different health states, and (2) illness-specific. Generic measurements, such as the Sickness Impact Profile, SF-36 and Quality of Well-Being Scale, measure a variety of dimensions of well-being to identify benefits and side effects of therapy as a result of the illness condition and its management. The disadvantage is they might lose some important aspects of a treatment or function related to a disease. Illness- or population-specific measurements may be the solution, but their specificity is such that these measurements may never be specific enough considering that even when addressing a specific illness, there is variety in the stage or severity, the therapy involved, age differences and co-morbidities. Specific measurements may also lose the ability to allow comparison across different populations with different conditions, if they do not measure the total scope of HRQOL (Wenger *et al*., 1996).

5.5.1 *Generic instruments*

Fayers and Machin (2001) define generic instruments as intended to be for general use, irrespective of the illness. The advantage is that they are also applicable to the healthy population which, hence can be compared with the ill population. The disadvantage for the ill population is that it is less sensitive to impairment. The following generic measurements are the most commonly used.

5.5.1.1 Sickness Impact Profile (SIP)

This Sickness Impact Profile (SIP) (Bergner, Bibbitt, Carter & Gibson, 1981) was designed to measure perceived social status by assessing its impact upon behaviour. The SIP was designed to measure new treatments and to evaluate health levels in the population. It consists of 136 items in twelve main areas of dysfunction. The items are negatively worded to represent dysfunction, e.g."I do not speak clearly when I am under stress", "I am having trouble writing or typing". Participants mark the conditions that are applicable to them. This measurement is found to be sensitive to minor changes in morbidity. However, its emphasis is on behaviour, and not on feelings and perceptions.

5.5.1.2 Nottingham Health Profile

The Nottingham Health Profile (NHP) was developed by Hunt, McKenna, McEwen, Williams and Papp (1981). It measures emotional, social and physical distress. There are 38 items in six sections. It covers topics such as sleep, pain, emotional reactions, social isolation, physical mobility and energy level, e.g. "I'm tired all the time", "I feel lonely". The NHP is measured using a yes or no response to the items. The NHP is not recommended for patients during their stay in hospital.

5.5.1.3 36-item Short Form and 12-item Short Form

The SF-36 was developed by Ware *et al*. (1993). The SF-36 measures general health status and was created to be less time consuming. The SF-12 is a simpler and shorter version of the SF-36. Most items use a more elaborate three-, five- or six-point Likert scale, although there are also a yes/no questions. It measures physical, emotional and social aspects of quality of life. Some items ask about the present condition, but most refer to the past four weeks. Fayners and Michin (2001) posed a criticism of the physical functioning aspect. For example, "Does your health limit you in these activities? If so, how much?" which is followed by several questions such as: climbing several stairs, walking more than a mile, walking several blocks, walking one block, and the response are: "Yes, limited a lot", "Yes, limited a little" or "No, not limited at all". Another limitation of this tool is that instinctively, individuals who never perform the activity might choose "No, not limited at all", which is categorised as the highest level of functioning.

5.5.1.4 EuroQol (EQ-5D)

The EuroQoL or the Rotterdam Symptom Checklist was developed by Brooks (1996) and was created in a multi-country setting. It offers a simple measurement, and it only takes two minutes to complete. There are five dimensions included: mobility, self-care, usual activities, pain/discomfort and anxiety/depression, and each one is followed by a three-category response scale. For example: Mobility: "I have no problems in walking about", "I have some problems in walking about" and "I am confined to bed". Participants will tick one that applies. At the end, there is a 20 cm-vertical line where participants should mark "your own health today" between the score of 0 to 100. The measurement is very simple and therefore does not reveal depth of HRQOL. The use of this measurement is best when accompanied by another measurement (Brooks, 1996).

Most of these instruments were developed in earlier times and tend to emphasise physical aspects, ignoring other aspects such as emotions and social aspects. The following section explains a disease-specific instrument for heart disease.

5.5.2 *Heart-Disease Specific Instruments*

Measuring cardio-specific HRQOL outcomes after MI presents issues of the type of treatment received (thrombolytic therapy, coronary angioplasty, CABG surgery), the setting (intensive care, remainder of the hospital stay, or post-discharge), as well as the physical, cognitive and emotional state (Wenger *et al*., 1996).

5.5.2.1 Seattle Angina Questionnaire

This measurement was designed to measure well-being in people with coronary artery disease by Spertus, Winder, Dewhurst, Deyo, Prodzinski, McDonnell and Fihn (1995). It contains five scales, which are measured by one to four items. The first scale, *physical limitation* (item 1) measures the degree of how daily activities are affected by the disease in nine sub-items; *angina stability* (item 2) measures changes in the frequency of angina at most strenuous level of activity; *angina frequency* (item 3 and 4); treatment satisfaction (item 5-8); and disease perception (item 9-11) which characterises the burden of having coronary artery disease on HRQOL. There is no general score as each scale is treated separately. The scoring of this measurement is not straightforward. Items for are assigned with ordinal value with 1 as the lowest level of functioning. Each item for each scale is summed using an ordinal value with 1 as the lowest level. Scale scores are then transformed to 0 to 100.

5.5.2.2 MacNew Heart Disease Health-Related Quality of Life

The MacNew Heart Disease HRQOL (MacNew) questionnaire (Dixon, Lynette, Lim, & Oldridge, 2002) is an adjusted version from the original Quality of Life after Myocardial Infarction (QLMI) scale (Oldridge *et al*., 1991; Kirshner & Guyatt, 1985). The original QLMI was a 97-item questionnaire and it was interviewer-administered, compared with the MacNew questionnaire which consists of 27 items and can easily be self-administered. It is designed to measure how CHD and its treatment disrupt daily activities and physical, emotional, and social functioning (Höfer *et al*., 2004). The original version was created in English, but today this measurement is also available in Dutch, Farsi, German, and Spanish (Höfer *et al*., 2004).

The MacNew questionnaire is a reliable tool. The items are based on a 7-point scale, with lower scores indicating a lower HRQOL. In the original study, the scales were divided into three scales: *emotional* (11 items), *physical and daily activities* (5 items), and *social* (10 items). For details of the items for these scales, see Table 7.1 in section 7.3. The average Cronbach's alpha of reliability of the responses is .93 to .95 across its three scales (Valenti, Lim, Heller & Knapp, 1996). Valenti *et al*. suggest that it is possible to omit the last item about sexual intercourse following a heart attack, should that be considered appropriate. Also, a score is not calculated for a domain if less than half the items in that domain have been completed. Missing items do not contribute to the total score.

5.6 Questionnaire adaptations

Many standardised questionnaires have been developed in the Western world. They are mostly available in English. When these questionnaires are to be used in a different setting and language, they need to be adapted to that language and

culture, without changing the intended meaning. The idea is to develop an instrument that is culture-fair, since it is unrealistic, if not impossible, to have a culture-free one. According to Cella, Lloyd and Wright (1996) the aim is to construct an instrument based on a common core of items that are not culture-biased and also not more biased to one group than another. They argue that this is to ensure that different cultural groups are evaluated without significant bias, that different cultural groups are not made to look similar, and that the meaning of HRQOL, such as emotional well-being, social well-being and physical well-being are evaluated within the context of culture. There is a need for 'equivalence', which is the absence of item bias. The following section explains the adaptation of questionnaires which will be used in this study.

There are different ways to translate a measure into another language (Cella *et al*., 1996). One-way translation involves asking a bilingual person to translate the original version into the target language. This is the most cost-effective method, but is highly subjective. Another method is translation by committee, it involves commissioning two independent translators at the same time to resolve any differences in each of their translations, or by having a third translator to opt for the better version. This option is also less costly, but there is a possibility that each translator may be reluctant to criticise the other, or simply agree on a common worldview. The third method is iterative double (back) translation (with or without decentering). This iterative double translation involves commissioning one independent translator to translate to the target language and another independent translator to back-translate to the original language. The result is compared with the original instrument to identify any important changes. These inconsistencies are then resolved by the researcher. This method may also impose a common worldview, which can be resolved by employing another independent back-translator(s) who is both bilingual and bicultural. Finally, simultaneous forward/single back translation (with or without decentering) is similar to the

iterative double translation with the difference being that only one new document is created at any given time, either the first forward, first backward, or second forward translation. Two simultaneous forward translations are performed by independent translation teams. These two forward translations are reconciled into a third forward translation, and are later back-translated. The reconciled versions are later approved by expert bilingual and bicultural advisors for comment. This procedure is the most reliable compared with the others.

Bradley (1994) suggests the following ideal procedure: (1) initially, the translation is done by 'Translator A', who is a native speaker of the target language. Translator A should have experience in questionnaire design and development, or if that is not possible, should be supervised by someone who has such experience. Translator A needs to be informed about the structure and purpose of the questionnaire being translated. (2) Translation by Translator A is then back-translated by 'translator B'. Translator B needs to be a native speaker of the language used in the original questionnaire. This person must never see either the original document or any other version. If possible, the back-translation procedure is conducted by two different back-translators. (3) The back-translation(s) should then be approved by the designer of the questionnaire or by translator A's supervisor, who has experience with questionnaire design and development. (4) Any differences between the first translation and the back-translation(s) should be discussed with the original translator A and retranslated if necessary. (5) If being retranslated, the documents should be sent to a different independent translator, Translator C, for back-translation. This procedure is repeated as necessary until there are no discrepancies using a different back-translator on each separate occasion. (6) The translation should be carefully inspected by a native speaker with experience of questionnaire design and psychometric development. This can be Translator A or A's supervisor to make sure any ambiguity of the item is reconciled. (7) The translated questionnaire should be treated as a new instrument

and will need to have similar psychometric procedures that would be expected of any new instrument, or an old one being used with a new population. Hence, the psychometric properties need to be examined when data are first obtained from use of the new translation of the questionnaires. This is to make sure that internal consistency and construct validity remain satisfactory using Cronbach's Alpha coefficient of reliability, or appropriate intercorrelations of items within each subscale. Factor analyses should confirm the nature of any expected subscales with the required items loading highly on their corresponding subscales. Bradley (1994) recommends the analysis of construct validity and other forms of validity and reliability. As an example, one of the most thorough and comprehensive translations was during the translation process of the International Quality of Life Assessment (IQOLA) Project. The questionnaire used, SF-36, was adapted from English to be used in 10 countries. The procedure was similar to that proposed by Bradley (1994) with the addition of cultural considerations. Their procedures started by reproduction of the original survey where during this process, a similar procedure to point 1 to 6 as described by Bradley (1994) above, was conducted by a cross-cultural analysis of quantitative evaluations before data were completed. They then test the psychometric properties by scoring algorithms using summated rating scale assumptions, inter-item discriminant validity, hypotheses regarding item values, items response theory, features of scale score distributions, and reliability of scale scores were calculated. Finally, correlations among scales and factor analyses of structure were calculated, followed by interpretation in relation to known differences between groups and to general population norms. In addition, each translator was asked to indicate the translation difficulty for each scale. Then an international meeting was held gathering the translators from 10 countries to discuss the item-by-item difficulties. The aim was to raise the problems encountered during the translation process in each country, clarify the intended meaning of the items, and to discuss the discrepancy of the translated version (Bullinger *et al*., 1998; Ware *et al*., 1995; Ware *et al*., 1996).

These projects are examples of the highest standard in adapting a questionnaire. However, their method is time-consuming and required a very large resource. The adaptation process in the present study will not reach such a standard considering time, resource, and financial limitations. Moreover, this research requires translation of three measurements which triples the amount of work of the International Quality Of Life Assessment project. In this study, three measurements, namely B-IPQ, Brief-COPE and MacNew questionnaire, will require adaptation into the Indonesian language. The procedures undertaken in adapting these measurements involve sworn-translators who are native Indonesian speakers. Sworn-translators are commonly available in countries where English is not the first language. They are registered and sworn by a government body for translating certificates or other important documents. First, these measurements are translated to the Indonesian language by a sworn-translator. These will then be checked by qualified people in the field who are native Indonesian speakers. This version is then back-translated to English language by an independent sworn-translator. This version is checked by qualified people who are native English speakers.

5.7 Conclusion

This current study used the definition of HRQOL by Höfer *et al*. (2004) where they acknowledge all aspects of HRQOL, that is, physical, emotional and social well-being and include the perceptions of dimensions of HRQOL measurement.

There are many readily available questionnaires to measure HRQOL. Some are designed for general conditions, and some are specifically designed for a particular disease. This study will use a disease specific measure of HRQOL in the heart disease population. The MacNew questionnaire is a reliable tool with high internal reliability and is readily available. It is a widely used and has been tested

in different populations. The adaptation of the questionnaires, particularly the MacNew questionnaire was conducted to a high standard.

The MacNew questionnaire can also be self-administered by participants. However, considering the conditions of the participants who have just had a heart attack and are still in hospital, the number of items involved, and for reasons of practicality, it was decided that the researcher would administer the questionnaires in the form of a structured research interview, the MacNew questionnaire will be administered by the researchers.

The psychometric properties of these measurements are analysed in Part Three. The following chapter explains the methodology used in the current thesis.

CHAPTER 6 GENERAL METHODOLOGY

6.1 Introduction

This chapter introduces the general methodology that applies to the studies in both countries. More specific details and conditions of the studies in each country are presented in Chapter Nine and Chapter Ten. Following these within-country analyses, Chapter Ten provides a between-country analysis.

In this chapter, the aim and objectives of this study are set out, followed by the study design, sampling technique including the inclusion and exclusion criteria, sample characteristics, recruitment process and, finally, some general ethical considerations.

6.2 Aim and objectives of the study

The aim of this thesis is to examine relationships between cardiac illness beliefs, coping cognitions, and heart-disease HRQOL in samples drawn from Western and Eastern cultures during their hospital stay. No causal interferences will be made, as explained section 6.3. More precisely, the studies will examine how illness beliefs and coping cognitions in Eastern and Western cultures differ while spending time in hospital, as well as how these elements relate to heart disease specific HRQOL.

The specific objectives of these studies are: (1) to adapt the standardised and widely used B-IPQ, Brief-COPE, and the MacNew questionnaire to the Indonesian language; (2) to test these newly adapted Indonesian versions in an Indonesian in-patient sample of heart attack survivors (see Chapter Eight); (3) to explore an

influence of socio-demographic and clinical variables upon illness beliefs, coping cognitions and HRQOL in both countries (Chapters Nine and Ten); (4) after controlling the socio-economic and clinical variables, to test the associations between illness beliefs and coping cognitions on HRQOL in the in-patient sample of the each country (see Chapters Nine and Ten); and (5) to conduct a comparison between both countries (Chapter Eleven).

6.3 Hypotheses of the study

Following theoretical explanations and previous research in set out in Chapters Two to Five, the current study assessed concurrent associations between coping cognitions and illness beliefs and heart-disease HRQOL in each country (see Chapters Nine and Ten), as well as both countries (see Chapter Eleven).

Based on previous research on the CSM, it is predicted that (1) IPQ scores on perceived *consequences*, perceived *timeline*, perceived *identity*, perceived *concern* and perceived *emotional responses* will show a significant negative correlation and be concurrently associated with the *emotional*, *physical* and *social* MacNew scales in each country as well as both countries combined. Further, it is predicted that IPQ scores on perceived illness *understanding*, perceived *personal control* and perceived *treatment control* will show a significant positive correlation and be concurrently associated with the *emotional*, *physical* and *social* MacNew scales in each country as well as the combined analyses (Chapters Nine and Ten) ; (2) the British-Indian/Pakistani sample will show a higher score on *spiritual* coping scale in the Brief-COPE compared with the British-White sample (Chapter Eleven), and the Indonesian sample will show a higher score than the UK sample (Chapter Eleven), and; (3) the British-Indian/Pakistani sample will show a lower score on the *substance use* coping scale in the Brief-COPE compared with the British-White sample (Chapter Eleven), and the UK sample will show a higher score than

the Eastern sample (Chapter Eleven), and (4) in this initial stage of CHD, *avoidance* coping in the Brief-COPE scale will be concurrently associated with better scores on the *emotional*, *physical* and *social* MacNew scales in each country analysis (Chapter Nine and Ten) and combined sample (Chapter Eleven).

6.4 Study design

In order to examine whether cardiac illness beliefs and coping strategies are concurrently associated with HRQOL, this study was designed as a cross-sectional correlational survey. Thus, it involved psychometric measurement without making any manipulation or causal interferences (Field & Hole, 2003). The study took place across two continents: Europe and Asia. The UK represented (Western) Europe, and Indonesia and India represented Asian countries. However, as explained in section 1.2, only the UK and Indonesian studies will be analysed.

The Indonesian study, took place in the autumn of 2006 through to the summer of 2007. Data collection was protracted due to the need for two separate visits to Indonesia and the logistics of recruitment and travelling within Jakarta. The UK study ran from September 2008 until March 2009, involving data collection in six hospitals. These hospitals were targeted due to their proximity to the concentration of minority ethnic groups, particularly the vulnerable group of British South-Asians. All of these hospitals were around the West of London. Further details of these two studies are presented in Chapter Eight and Chapter Nine respectively. The following Diagram 6.1 illustrates the procedure of the data collections.

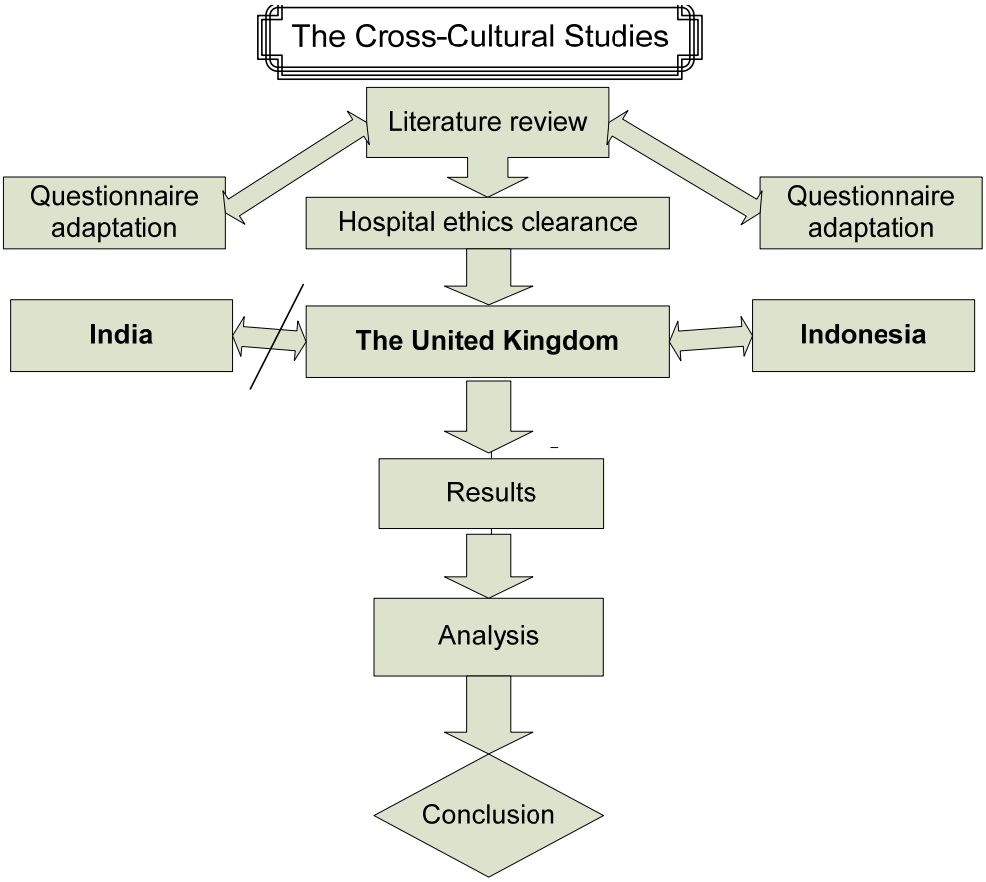

Diagram 6.1

Flow chart of the cross-cultural study

The variables measured in this study are: illness beliefs, coping cognitions, heart disease HRQOL and additional socio-demographic and clinical characteristics

6.5 Sampling Strategy

The sampling technique used was opportunistic sampling. This method of sampling is the most widely used method of choosing participants by chance and

in an unstructured way in order to gain a sample from the population. However, this study was designed to reach people with heart attack during their hospital stay in hospitals with cardiac wards. In the UK, the hospitals in the London and the South-east were targeted based on the areas with higher minority ethnic groups. Therefore, the sampling technique used in this current study had a purposive element. In Indonesia, one of the hospitals was the main cardiac hospital and the other is a major hospital in Jakarta. Hospitals in both countries were visited on a regular basis to capture most, if not all, in-patients in cardiac wards.

The inclusion and exclusion criteria for participant recruitment: (1) Diagnosis of (first) heart attack within 14 days; and (2) able to understand and to communicate in the main language of the host country; and (3) physically capable of participating in the study. The exclusion criteria were: (1) history of diagnosis of other heart diseases; and (2) history of CABG surgery (see section 2.4.1).

Further explanations regarding first time heart attack criteria only apply to the Indonesian sample will be addressed in the section 9.4.

6.6 Sample characteristics

The following section explains the conditions the sample characteristics for this current study, for each country.

6.6.1 *Characteristics of UK sample*

One hundred and thirty participants were recruited from six NHS sites (Table 9.1). The participants were predominantly male (75%). Two-thirds of this sample fell into the older group of sixty years or older (n = 87) and there were 43 people in the younger group of less than sixty years old. The mean age was 68 years, with two-thirds of the participants belonging to the age group 60 to 99 and one-third

between 20 and 59. Not surprisingly, more than 86% of the participants had retired.

About a third of participants were recruited from Hospital 5 (32.3%), followed by Hospital 3 (30%) and Hospital 1 (26.9%). Participants with a first heart attack were in the majority at 85%, whereas 15% had had a previous attack. Nearly eighty percent of the participants were interviewed between one and seven days after their heart attack, and the rest between eight and 14 days (21%).

Table 6.1

Socio-demographic characteristics of the UK sample

Characteristics	Value
Gender	
- Male	98 (75%)
- Female	32 (25%)
Age	
Mean age	68 years
- Minimum	24 years
- Maximum	92 years
Age range	
- Age group 20-59	43 (33%)
- Age group 60-99	87 (67%)
Occupation	
- Retired	112 (86.2%)
- Construction worker	4 (3.2%)
- Financial advisor	2 (1.6%)
- Security manager	2 (1.6%)
- Taxi driver	2 (1.6%)
- Driving instructor	2 (1.6%)
- Researcher	1 (0.8%)
- Chief engineer	1 (0.8%)
- Cardiac-physiotherapist	1 (0.8%)
- Homemaker	1 (0.8%)
- Window cleaner	1 (0.8%)
- Lecturer	1 (0.8%)
Hospital origins:	
- Hospital 1	35 (26.9%)
- Hospital 2	7 (5.4%)
- Hospital 3	30 (23.1%)
- Hospital 4	14 (10.7%)
- Hospital 5	42 (32.3%)
- Hospital 6	2 (1.5%)

The proportion of males and females for every age group between 20 and 99 years is displayed (Diagram 6.1). In the age groups encompassing the ages of 50 to 79 years the gender ratio of heart attack is approximately 3:1 in 'favour' of males. However, in this sample, the numbers are nearly equal in the 80 years and above age category. Heart attack is uncommon in the under 40s, with the exception in this sample of three males aged between 20 and 29 and one female aged between 30 to 34.

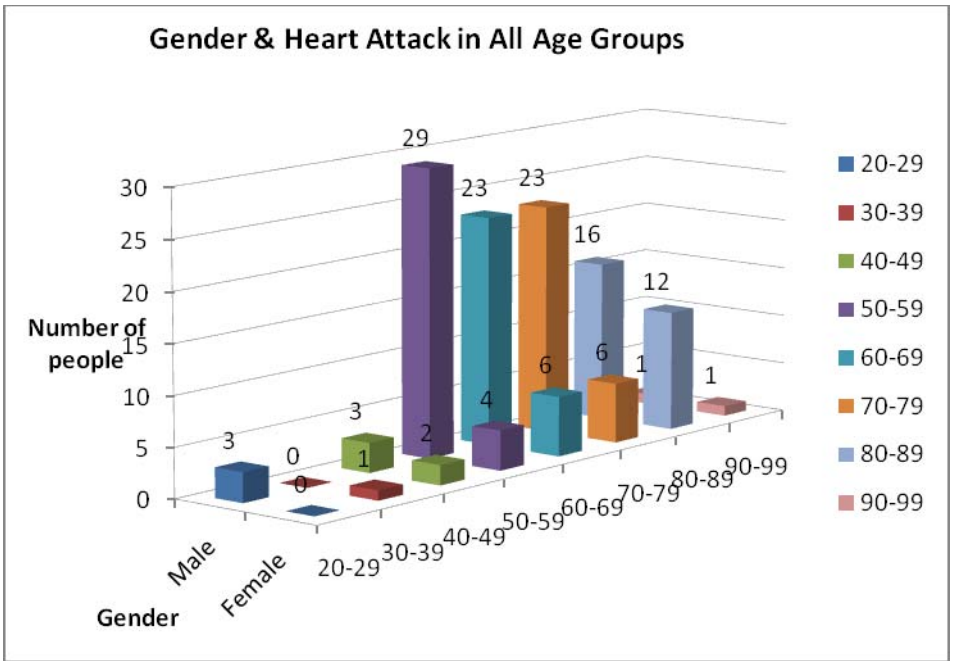

Diagram 6.1

Number of men and women with heart attack in different age groups

The occupation of the participants in this sample is depicted in the following diagram 9.2. Most participants (86%) are in the retirement age range. Of those who are working, the majority are unskilled manual workers, followed by managerial and technical occupations.

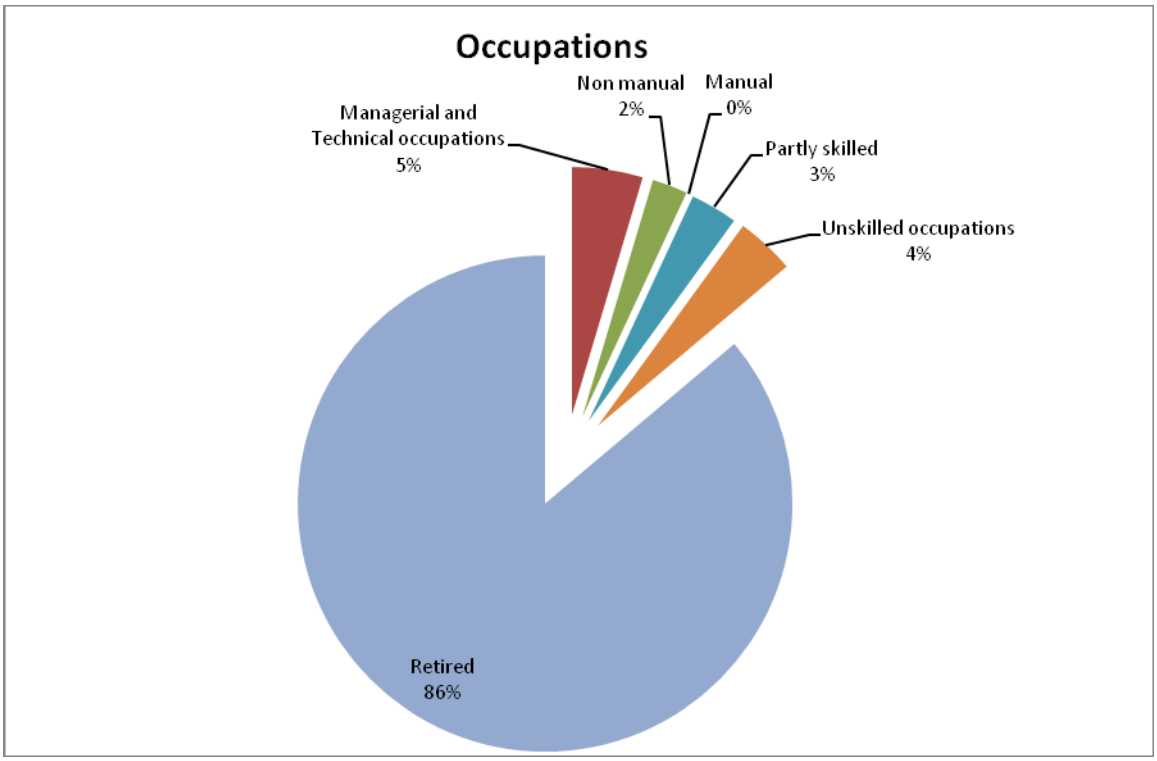

Diagram 6.2

Occupations of the UK sample

The medical history of the UK sample includes family history of CHD, previous heart attack and angina, pre-existing chronic disease, and known risk factors (Table 6.2). More than half of the sample had high blood pressure, and two-thirds had diabetes. Almost none of the participants had a previous diagnosis of angina.

In the UK, the benefits of opting for angioplasty, along with other improvements in the NHS service including the widespread use of thrombolytic therapy has resulted in a significant decrease of time spent in hospital. This is reflected in the average number of days spent in hospital at the time of interview. More than three-quarters of the UK sample had their heart attack onset within one week (79%) whereas, as reported in the next chapter, this applied to only 58% in the Indonesian sample. In this study, the difference in the time spent in hospital

between the East and West groups was found to be considerable. In the UK, this made it more difficult to contact people with a heart attack while they are hospitalised. Therefore, as explained in section 6.4, the inclusion criteria of first heart attack in the UK sample was eliminated.

Table 6.2

Clinical variables of the UK sample

Characteristics	Value
Recent heart attack onset within	
- Less than one week	103 (79%)
- One to two week	27 (21%)
High blood pressure	
- No	72 (55.4%)
- Yes	56 (43.1%)
- Not known	2 (1.5%)
Diabetes	
- No	87 (66.9%)
- Yes	43 (5.4%)
Previous angina pectoris	
- No	103 (81%)
- Yes	7 (5%)
Family history	
- No	68 (52.4%)
- Yes	54 (41.6%)
Smoking habits	
- No	52 (40%)
- Quit, 15 years or more	33 (25%)
- Quit, less than 15 years	17 (13.1%)
- Yes	28 (21.5%)

There was a gender difference in respect of first versus non-first timers (Diagram 6.3). In this sample men were nearly three times more likely than women to have a heart attack.

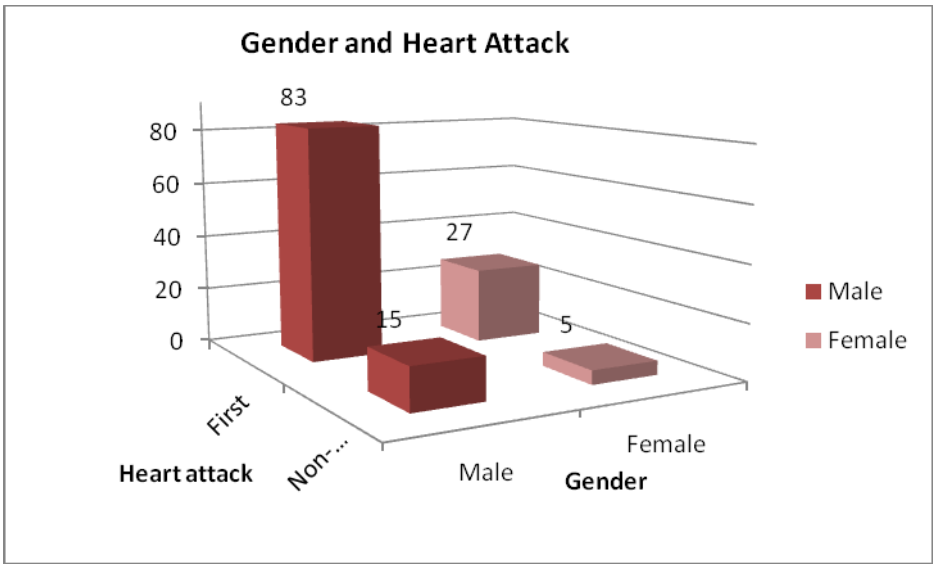

Diagram 6.3

Number of heart attack cases in relation to gender

This pattern is also repeated in the 50 to 79 years age group (Diagram 9.4). Recurring heart attack is more common in the group of 50 years or older.

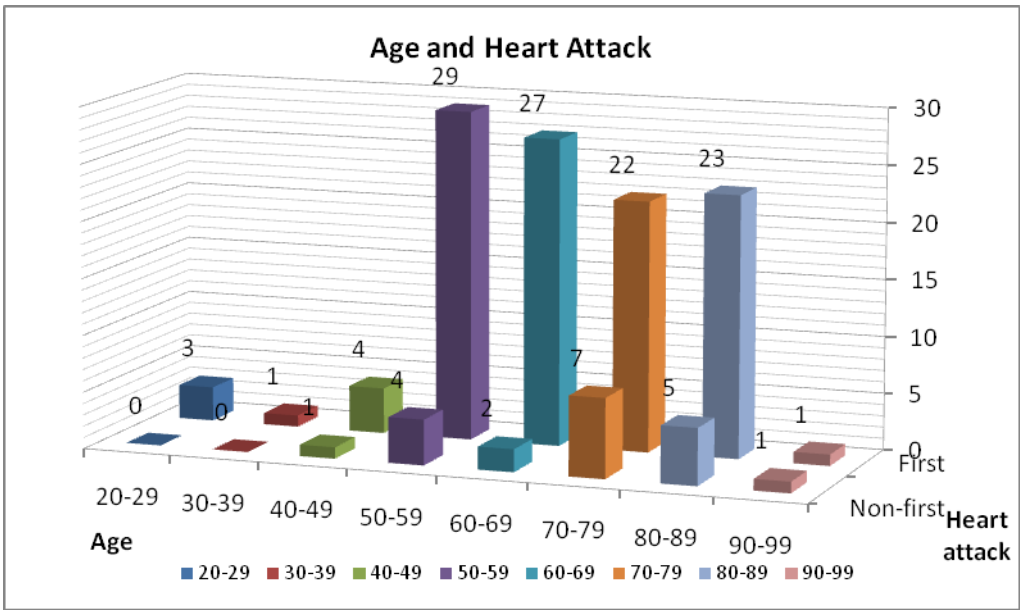

Diagram 6.4

Number of heart attack cases in relation to age

Participants reported different kinds of main symptoms. Half of the participants experienced chest pain (50%), followed by breathing difficulty (16%). A smaller proportion said they experienced indigestion (6%) and heartburn (1%). Participants also reported pain in different parts of the body; in the arm (5%), in the neck (4%) and back (2%). Also, several participants reported losing consciousness (4%), feeling worn out (2%) and vomiting (2%). However, four percent of the participants reported not experiencing any symptoms at all. The following Diagram 6.6 shows the proportion of the main symptoms reported.

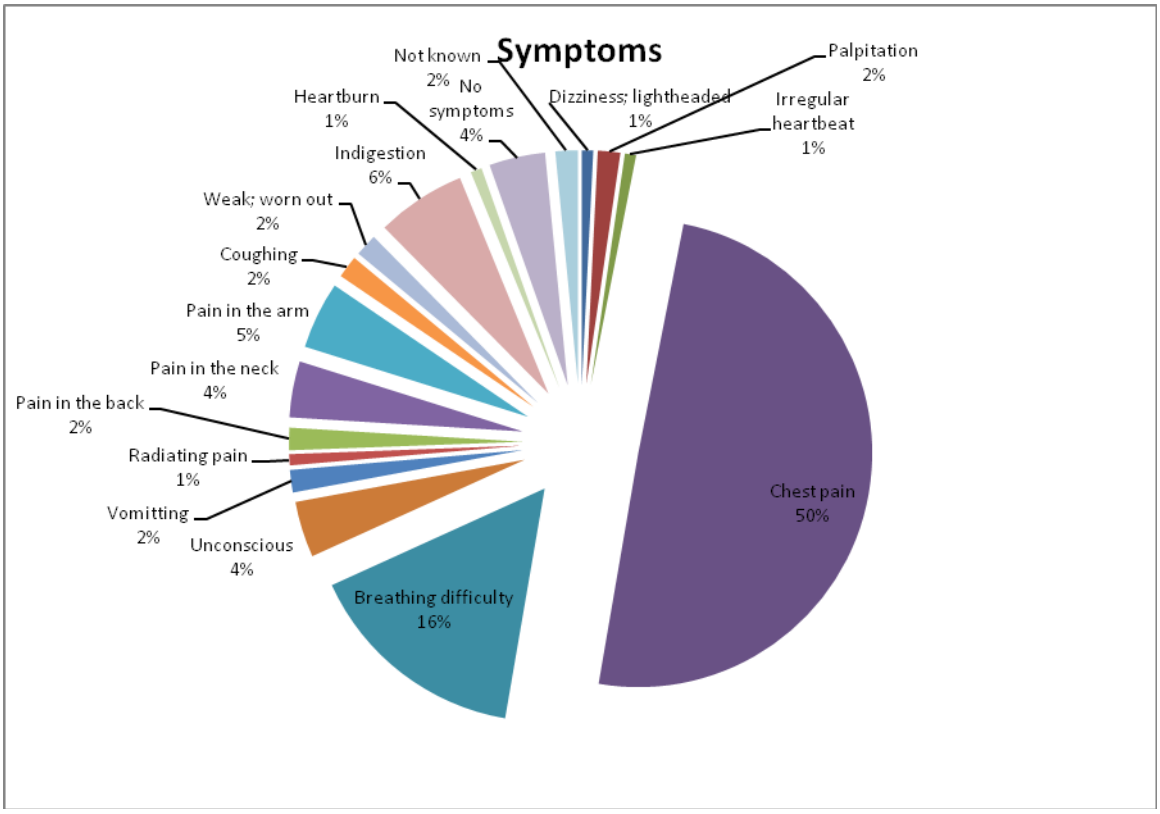

Diagram 6.6

Main symptoms experienced by participants

6.6.2 *Characteristics of Indonesian sample*

Most participants were recruited from Hospital A (Table 10.1). The majority were male (80.5%) with very few females (Diagram 6.7) admitted to the hospital for treatment following a heart attack. The average age of people experiencing a heart attack in this sample was 54 years, with a range of 33 to 72 years. More than three-quarters of this sample were in their productive age range. This is a reverse to the condition in the UK sample.

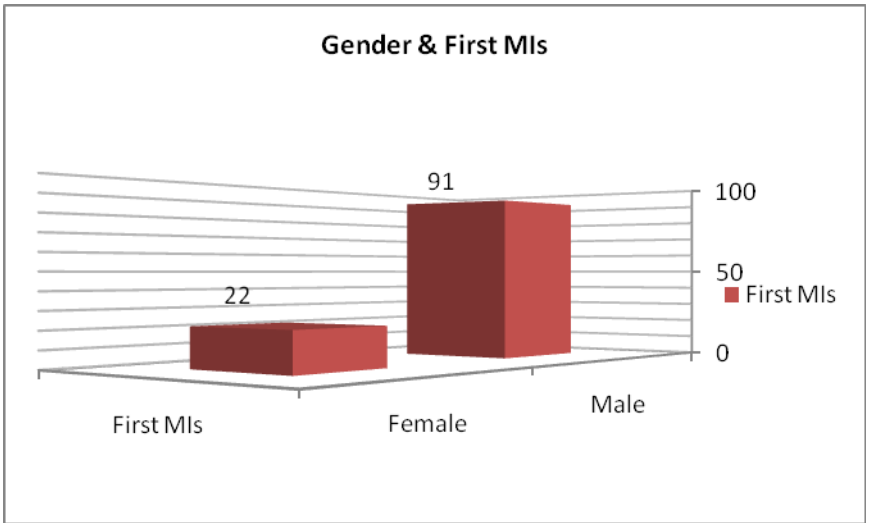

Diagram 6.7

Number of heart attack cases in relation to gender in the Indonesian sample

Furthermore, Diagram 6.8 shows the proportion of males and females for every age group between 20 to 99 years. Heart attack in women in this sample starts occurring at the age of 40 and the number increases with age. On the contrary, the number of men with heart attack in this sample peaked around the age of 50 years, decreased in the 60 year olds and then stabilised. None of the participants in this study were 80 years old or above.

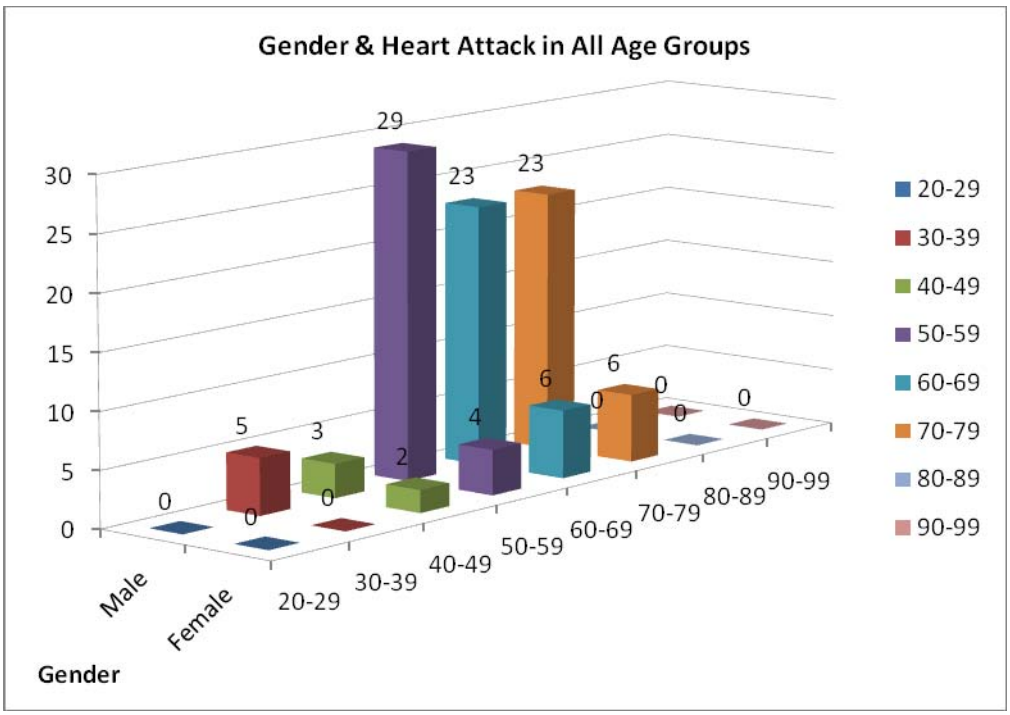

Diagram 6.8

Number of men and women with heart attack cases in relations to their age in the Indonesian sample

The occupations of the participants in this sample are represented in diagram 6.9 below. The participants were mix of professionals, managerial and technical occupations, skilled manual occupations, non-skilled manual occupations and partly-skilled. Unlike in the UK, none were in unskilled occupations. The highest proportion of this sample worked in skilled-manual occupations. Nearly one fifth were in the retirement age group (19.5%).

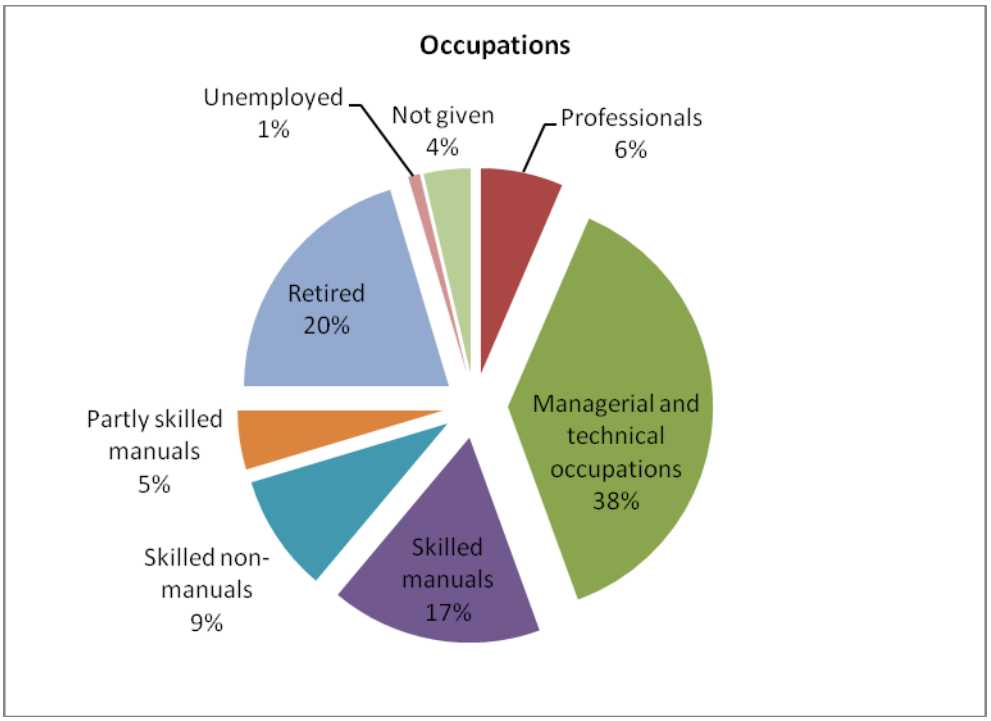

Diagram 6.9

Occupations of the Indonesian sample

On average, participants in this study had their first heart attack eight days prior to the data collection point. The range was from 4 to 14 days.

Clinical variables of the Indonesian sample revealed that more than three-quarters of the sample (79%) had their heart attack one week before data collection (Table 6.3). More than half of the sample has high blood pressure, and two-thirds have diabetes. Nearly all of the participants never had a diagnosed angina.

Table 6.3

Clinical variables of the Indonesian sample

Characteristics	Value
Recent heart attack onset within	
- Less than one week	66 (58.4%)
- One to two weeks	57 (41.6%)
High blood pressure	
- No	56 (49.6%)
- Yes	57 (50.4%)
Diabetes	
- No	80 (70.8%)
- Yes	33 (29.2%)
Previous angina pectoris	105 (92.9%)
- No	8 (7.1%)
- Yes	
Family history	
- No	79 (69.9%)
- Yes	34 (30.1%)
Smoking habits	
- No	38 (33.6%)
- Quit, 15 years or more	11 (10%)
- Quit, less than 15 years	11 (10%)
- Yes	53 (46.9%)

Participants in this study reported different kinds of main symptoms. Nearly half of the participants experienced chest pain (48%), followed by breathing difficulty (10%), losing consciousness (9%) and palpitations (9%). Four percent of the sample reported feeling weak or worn out. A smaller proportion described feelings of indigestion (3%). A further three percent of participants also reported pain in different parts of the body; in the legs and stomach (3% each).

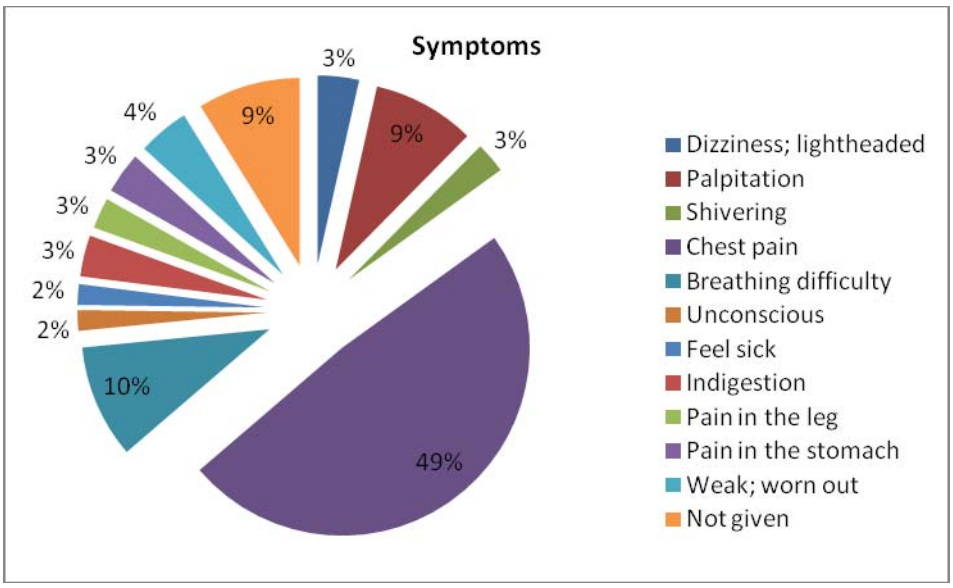

Diagram 6.10

Main symptoms experienced by participants

6.7 Locations

6.7.1 *The locations of the UK study*

The UK study was conducted around the West of London area. Ethical approval was granted by the Cambridgeshire IV Research Ethics Committee, and successful site-specific assessments were conducted by six NHS Hospital Trusts; three hospitals in West of London, one hospital in Buckinghamshire area and one hospital in Berkshire. Throughout this thesis, these sites will be referred to as Hospital 1, Hospital 2, Hospital 3, Hospital 4, Hospital 5 and Hospital 6. Due to high demands for research, one NHS Hospital declined access for this study during initial contact and in another site, did not have enough participants meeting the inclusion criteria. Hospital 1, Hospital 2 and Hospital 3 are located in outer London and Hospital 4 is located in inner London. Hospital 5 is located in Berkshire and Hospital 6 in the Buckinghamshire area. Similarly to the study by Lambert and Sevak (1996) (see section 3.3), these hospitals were chosen to target

British South-Asian groups, particularly British-Indians and British-Pakistanis. For example, Wembley is a common are of residence of many British-Indian people is within the coverage of Hospital 1; Southall is a common area of residence of British-Pakistanis and is within the range of Hospital 2; and the cities chosen in the two counties are locations where British-Indian and British-Pakistani people are easily found. Hospital 4 is the only hospital in inner London.

6.7.2 *Locations of the Indonesian study*

The study took place between November 2006 and September 2007. It was conducted in Hospital A, which is a specialist heart hospital, and Hospital B, which is a private general hospital. Following hospital ethics committee approval in these hospitals, the data and status of patients currently in the coronary care unit were gathered.

Generally, patients spend a few days in the coronary-care unit, followed by a few more days in the intensive care unit, depending on the severity of the heart attack. They are then transferred to the ward for recovery. After about 24 hours, most patients in the coronary-care unit have reached a stable condition and could be transferred to a lower-dependency ward. After about ten days, patients without complications are usually ready for discharge, but this tends to vary in practice. During the recovery process, patients usually stay in hospital between seven to fourteen days depending on the speed of their recovery, their preference to stay longer, or in some cases, due to financial problems some people prefer to leave earlier.

There are five types of hospital accommodation commonly found in hospitals in Indonesia. They are ranging from Class III as the most affordable to Class I as the most expensive, and followed by VIP and VVIP. At night, patients are allowed to

be accompanied by one family member. In this study, most patients were in the recovery period, so they were encouraged to walk around and socialise.

National insurance covers 80% of the expenses in Class III accommodation in state hospitals and patients pay the rest. National insurance is applicable to many Indonesian nationals if they are working for the government or most of the private companies. However, these privileges are not applicable to most freelance labour. With the money they make, health care is considered a luxury. Fortunately, in January 2007, a new health scheme for those with low income was introduced for Jakarta residents. Residents who are registered as having low income or unemployed are now entitled to free service and medications.

The other hospital included in this study is the Hospital B. This hospital is privately owned by the national oil company and it is subsidised for its staff member, but it is open for the general public. This hospital is situated in the south of Jakarta.

Patients meeting the inclusion criteria were identified from a board at the nurse stations. Following this, their medical records were cross-checked to confirm their eligibility. Clinical data and socio-demographic data of those who met the criteria were then obtained from their medical records. Similarly to the UK study, patients were approached while they were in their beds. There were some occasions of refusal: two female patients and three male patients declined to participate, and on another occasion, a family member refused participation. Their reasons were mostly fatigue or that they required some rest.

6.8 The recruitment process

Participants were recruited during their recovery stage in the coronary care unit of the hospital. With the help of the (cardiac) nurse, potential participants who met

the inclusion criteria were identified. The nurse introduced the researcher to the potential participants. Following an explanation of the study, those who agreed to participate were asked to sign a consent form. The researcher started by asking about socio-demographic and clinical variables, followed by the three questionnaires. The whole process took around 15 to 25 minutes depending on the condition of the participant and how elaborate their responses were. The protocol of the recruitment is summarised in the diagram 6.11.

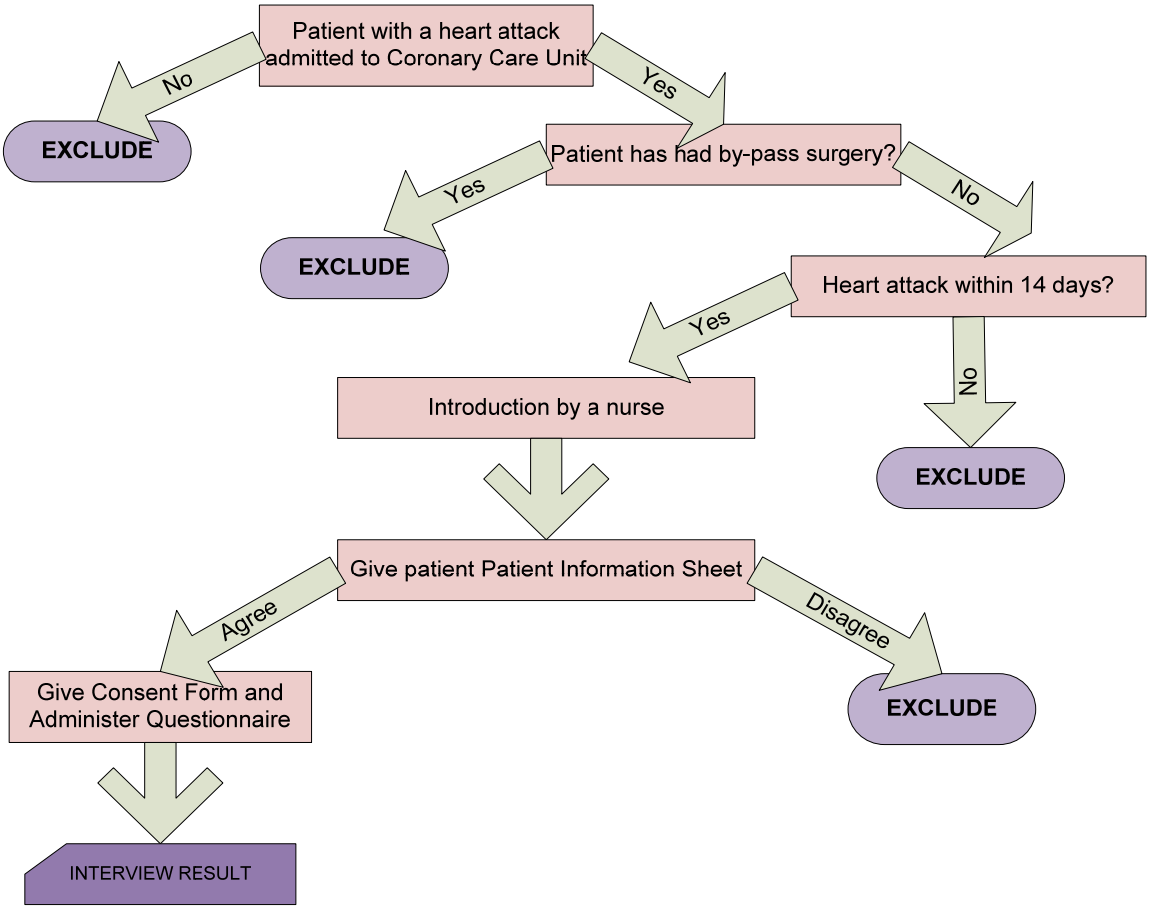

Diagram 6.11 Diagram of protocol for recruitment in the hospital

6.9 The instruments

The concepts measured in this study are based on elements of CSM: the individual's cardiac illness beliefs and coping strategies adopted to overcome stress following first-time infarct. This study is questionnaire-based, the psychometric properties which are discussed in Chapter Four and Chapter Five, and are as follows: (1) Brief-Illness Perception Questionnaire (see section 4.5) 2. Brief-COPE (see section 4.6); (3) MacNew Heart Disease Health-Related Quality of Life Questionnaire (see section 5.4.1.2); and (4) additional socio-demographic questions including age, gender, ethnicity, as well as clinical questions on smoking habits, family history of heart disease, history of diabetes, angina and high blood pressure.

For the UK participants, the socio-demographic questions enquired about participants' gender ("male" or "female"), date of birth, nationality ("British", "Other EU" or "Other2), duration of living in the UK ("How long have you lived in the UK?") which is classified into five categories ("I have always lived in the UK", "up to one year", "1 to 4 years", "5 to 10 years", "11 to 20 years", "more than 20 years"), marital status ("single", "married", "divorced", "live with my partner") and occupation ("What is your occupation?"). To find out about their ethnicity ("Please describe your ethnic origin?"), the options followed the UK 2001 population census. This was followed by a question on religion ("What is your religion?") the options are: Christianity, Buddhism, Hinduism, Islam, Sikhism, Other, no religion, or refused.

Similarly for the Indonesian participants, those questions were asked with the exception of nationality, duration of living in the country, and ethnic origins. In addition, they were also asked to specify their ethnicity (e.g. Javanese, Sudanese, etc) which related to dialects, food consumption and preparation, and other cultural differences. An important question regarding hospital expenses was also

asked and whether they were qualified for free healthcare or if they were private patients.

For clinical questions, both the UK and the Indonesian participants were asked to state the date on which they had their heart attack, whether they realised they were having a heart attack (yes or no), an open ended questions on up to three symptoms they experienced at the onset, history of heart problem in the family (yes or no), history of hypertension, high cholesterol, diabetes, and angina. Their smoking habits prior to the onset were classified into four categories: never, quit 15 years or more, quit less than 15 years or regular smoker. The Lung Health Study Research Group found reduced risk for cardiovascular disease by 22% (Anthonisen, Skeans, Wise, Manfreda, Kanner & Conett, 2005) after quitting for 14.5 years. Also, the US Surgeon General's 1990 Report (Central Disease Control, 1990) suggested after 15 years since quitting the risk of CHD became similar to those who never smoked. Therefore, during data analysis those who quit smoking 15 years or more are merged with those who never smoked. If they were regular smoker, details of the number of cigarettes per day was also requested. Finally, their exercise habits ("Have you exercised regularly in the past three months?") was also recorded and if they exercised regularly, they are asked about the type of exercise and how often they exercised. The term regular exercisers applied to those who conducted at least a moderate amount of exercise three times a week.

These questionnaires were administered by means of a research interview. That is to say, questions were read out in a standard fashion and participant responses written down by the researcher. This allowed for clarification and checking by the researcher, as well as considering the participant's health condition shortly after a cardiac event. Administration took 15 to 25 minutes. In some cases, questionnaires were adapted into another language and the procedure adopted for this is detailed in Chapter Five.

6.10 Data analysis

Factor analysis and Principal Component Analysis (PCA) was applied for B-IPQ and Brief-COPE prior to the analysis in order to compare the factors of this study with previous studies. This is important, especially for the newly adapted Indonesian version. It was done not only to compare the factor loadings with the previous ones, but also to detect if there were any cultural differences between Western and Eastern samples. Factor loading refers to the regression coefficient of a factor for the linear model that describes a latent factor (Field 2009). The PCA was also conducted for the UK study to allow comparison with previous studies in the West. Where any difference in factor loadings from the measurements in each country was identified, decisions were made whether to follow the original studies, the UK or the Indonesian scales.

The cut-off point standards in item analysis were based on the size of the sample in the particular country. Stevens (2009) provides a guideline to conduct this. The critical value for testing the significance is the doubled value (Table 6.1). Using the nearest higher or lower value to find the range of discrete data points accordingly, it can be calculated the discrete value between 100 and 140 participants is .078. With 130 participants in the UK sample and 113 in the Indonesian sample, the critical values are .454 for the UK and .487 for the Indonesian sample.

Table 6.12

Guidelines to critical values based on number of participants (ά = .01) (Stevens, 2009)

n	Critical values	Critical values for testing the significance
50	.361	.722
80	.286	.572
100	.256	.512
140	.217	.434
180	.192	.384
200	.182	.364

Internal consistency was calculated using the Cronbach's alpha coefficient. The coefficient should be .7, although .8 is preferable (Pallant, 2007). Correlation was evaluated to examine the relationship between illness beliefs, coping styles, and HRQOL. A significance level of .05 was set for most of the tests, unless a more stringent level was needed in which case .01 was selected.

Before analysis, data were checked to see whether the assumptions four assumptions for parametric testing had been met: (1) data are normally distributed within the population, which can be checked visually using histogram, (2) homogeneity of variance, where variance should be stable across all variables, (3) data must be at least interval level, and (4) the behaviour of a participant is independent from the others (Field, 2009). Violation of any of the four assumptions resulted in data being treated as non-parametric, and the Chi-Square test was used instead of the *t*-test.

Correlational analysis was applied between both the illness beliefs and coping strategies. These were conducted using each individual scale or, in the case of the B-IPQ, on each item. The beliefs and coping strategies were correlated with the three scales of the MacNew questionnaire. HRQOL, the outcome measure, was

also measured against different socio-demographic factors. Any strong correlational value indicated a relationship between variables.

6.11 Ethical considerations

Prior to data collection, research ethics committee clearance was required in all countries. Ethical issues common to all countries are detailed below. The following principles of ethical decision-making were based by the Code of Ethics and Conduct (2006) by The British Psychological Society. These principles decided upon were: respect, competence, responsibility and integrity.

- Informed consent (autonomy)

  In this study, potential participants who met the inclusion criteria received an information sheet part 1, which explained the general aim of the study, background of the study, potential harm, potential benefit, and about the researcher. Those who agreed to take part were approached by the researcher. The researcher handed out the information sheet part 2, whenever participants required further information. The researcher then asked participants to sign the consent form prior to the interview. For the Indonesian and Indian studies, potential participants were approached by the researcher following an introduction by nursing staff, with information about the study. Potential participants who agreed to take part then signed the consent form, prior to data collection. The template and guidelines used for informed consent, information sheet part 1 and part 2 can be found on the website of the National Research Ethics Service of the NHS, www.nres.npsa.nhs.uk.

❖ Deception

In order to minimise the social desirability effect, participants received general information that this was a study on psychological experience following their heart attack. The participants in this study were informed that the research would require them to respond to questions regarding what they thought about their heart attack, and other questions relating to their psychological experience, as well as some questions about their personal data. There was no deception in this study.

❖ Confidentiality

Participants were assured that their responses would be kept confidential and used strictly for research purposes. No one, including hospital staff, would have access to their data. This was necessary for ethical conduct and crucial in order to minimise the social desirability effect.

❖ Protection from physical and psychological harm (non-maleficence)

The experience of heart attack is an emotional event for some individuals, and in this case it was possible that the research interview would cause distress. For the UK study, as a condition of the NHS Research Ethics Committee, psychological services were organised as a back-up. In some hospitals where these services were not offered, it was decided that any distressed participants would be referred back to their GP who would be able to direct them to an appropriate community mental health service. None of the participants in the UK were in a distressed state that required such a service. However, during the study in Jakarta, one male participant burst into tears towards the end of the interview. The researcher felt the need to stop the interview and ask whether he would like to have the nurse to come, which he refused. The researcher apologised and ended the interview at that moment. The researcher also informed the attending nurse

about the situation and asked them to check his condition. Regarding the items in the questionnaire, one particular item about sexual functioning in the MacNew questionnaire clearly made participants embarrassed, and for this reason, this item was omitted. Valenti *et al*. (2002) also made this an optional item. When a participant appeared to be in denial the researcher was careful on not to use terms such as 'heart attack', but rather referred to the experience of the pain.

The researcher tried to prevent fatigue by presenting the brief version of the questionnaire whenever available. A rapport was developed at the beginning of the interview by introducing the socio-demographic questions, which were easier to answer. There were some occasions when participants had a mood induction during the interview. When this happened, the researcher asked whether they felt alright to give a response or to move on to the next question. In most cases participants agreed to continue. In other cases, they required some time to respond.

Ethical approval was gained for all sites. For the UK study, The NHS Research Ethics Committee gave a favourable opinion to this study. Further separate Site-Specific Assessments were then undertaken by each study site. In Indonesia the process was slightly different since permission to carry out the study was obtained from the research ethics committee of each hospital. The researcher needed to submit a research proposal in the Indonesian language to either the Human Resource Department (HR) or, the Research and Development (R&D) Department. The department later handed this to the Head of R&D and to the Director of the hospital. Before making the decision, they invited the researcher to present the proposed study to a panel of cardiologists, physicians and representatives from the HR or R&D department. Such ethical reviews were conducted in three

hospitals in Jakarta, where ethical permission was granted in all cases following the payment of a small fee. Finally, for a hospital in Mumbai a similar process was successfully negotiated.

6.12 Conclusion

In this chapter, the general methodologies for both countries were discussed. Hypotheses of this thesis were explained, as well as the inclusion and exclusion criteria. Prior to data analysis, PCA were conducted for the Brief-COPE and the MacNew questionnaire. The results were then compared between countries, as well as with the original studies. Statistical analysis of *t*-tests or Chi-square tests, where applicable, and regression analysis were opted for in analysing the results from the studies in the UK and Indonesia.

The studies in the UK and Indonesia have been completed with sufficient number of participants. However, in Mumbai, India where the promised rate of recruitment did not materialise and data were insufficient for statistical analysis.

In the following two chapters the results of the psychometric properties of the Brief COPE and the MacNew questionnaire in the UK and Indonesia are presented.

PART THREE: PSYCHOMETRIC PROPERTIES OF QUESTIONNAIRES

Part Two had provided the background, justification and methodology for the present study. Part Three consists of two chapters analysing the psychometric properties for the MacNew questionnaire and Brief-COPE in each of the countries.

This part begins with Chapter Seven, which presents the principal component analysis from the UK sample and is followed by Chapter Eight containing the same from the Indonesian sample. Sample characteristics of the UK and the Indonesian sample recruited in this analysis was explained in the previous chapter.

CHAPTER 7 THE UK SAMPLE MEASURES

7.1 Introduction

Based on the specific objectives set out in section 6.2, the objective of this chapter is to test the measurements used in this study when measured in the UK sample. Although the measurements were developed using English, they were developed and tested in different Western sample: B-IPQ in New Zealand and the UK, Brief-COPE in the US and the MacNew questionnaires in Australia. Although, the UK study is also in the West, this study targeted ethnic minorities in the UK, which may differ from the rest of British-White population. Moreover, previous studies have shown that a measurement can respond differently in different settings within Western culture. For example, with forced three-factor solution, the MacNew questionnaire revealed slightly different item content in the Dutch population compared with the original sample in Australia (De Gucht *et al*., 2005). This chapter will assess the responsiveness of the Brief-COPE and the MacNew questionnaire when administered to the specific populations of people with recent heart attack living in or to the West of London.

The population of this study is people who have experienced a recent heart attack. As stated in Chapter One, the population is also limited to the hospitals where ethical approval had been gained and to individuals who were admitted during the six month period of data collection. Sample used in testing for psychometric properties are the same as those in the main study. More details of the UK sample are presented in section 6.5.1.

In this chapter, the methodology of analysing the psychometric properties are set out, followed by the Principal Component Analysis (PCA) and reliability analysis of Brief-COPE and MacNew questionnaire and, finally, discussions.

7.2 Methodology

In this chapter, the psychometric properties of the two measurements are analysed using; PCA and reliability testing. This analysis applies to the UK sample as a whole and to ethnic minorities in particular.

As most behavioural scales rely on several items in measuring a construct, it makes more sense to manage a set of variables by grouping them. Factor analysis is the way to achieve this in a close-ended questionnaire (Howitt & Cramer, 2008). SPSS does this by using a correlation matrix. Field (2009) differentiates factor analysis and PCA. While factor analysis estimates the underlying factors using various assumptions; PCA establishes the linear components in the data and how a particular variable contributes to the particular component. Both this chapter on the UK sample and the next chapter on Indonesian sample use the PCA method.

There are two ways to decide how many factors to retain (see section 6.7). By using a scree plot and the eigenvalues. The inflexion of the curve is then used to decide the number of factors that will be retained.

In determining the significance of a factor loading, Stevens (2009) (see section 6.10) suggests that for a sample size higher than 100, the value of the factor loading should be greater than 0.512 using an alpha level of .01 (two-tailed). Therefore, in this UK sample of 130, a set of .453 will be used based on the interpolation of critical values scores between 100 and 140 (see section 6.10). For the British-Whites, a higher set of .512 will be used. Communality is the proportion common variance for a particular variable (Field, 2009). It is desirable

to keep as many factors as possible, which will be reflected in communalities closer to 1 (Field, 2009).

Reliability testing is important in the construction of scales (Howitt & Cramer, 2008). The function of reliability testing is to make sure that all of the items in a scale are measuring the intended concept. Therefore, every item should correlate well with each other, as well as correlating to other scales (Howitt & Cramer, 2008). Reliability testing in this study uses Cronbach's coefficient alpha method. This alpha reliability testing is an improvement on the split-half method. Split-half reliability is a method of correlating the sum of the first half of items with the second half. The split-half method is criticised for the way in which splitting is conducted, which can bias the result. Cronbach's coefficient alpha overcomes this problem by calculating the average of all possible split-half reliabilities on a scale (Howitt & Cramer, 2008).

The sample in the British study comprises 130 participants, which includes populations of British-Whites (n = 100) and the minority ethnic groups (n = 30), mostly consisting of British-Indians and British-Pakistanis and one British-African participant. Following the method in Nazroo (1997), British-Indian and British-Pakistani participants are analysed as one group, British-Indian/Pakistani.

The following sections present the analysis of the measurements in the UK sample. It begins with analysis of the MacNew questionnaire, including the PCA and Cronbach's coefficient alpha, and this is followed by analysis of the Brief-COPE in subsequent sections.

7.3 Principal component analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire

The original version of the MacNew questionnaire in the English language was observed to have a three-factor solution (*emotional*, physical and daily activities (*physical*), and *social* scale). Further details of the MacNew questionnaire are set out in Chapter Five. The following table summarises the scales from the original MacNew (Dixon *et al*., 2002) with the number in bracket referring to the order of items in the questionnaire.

Table 7.1

List of the three-factors of the original study of the MacNew questionnaire (Dixon et al., 2002)

I.	Emotional	II.	Physical	III.	Social
1.	Frustrated (1)	1.	Short of breath (9)	1.	More dependent (11)
2.	Worthless (2)	2.	Chest pain (14)	2.	Social activities (12)
3.	Confident (3)	3.	Aching legs (16)	3.	Others/less confidence (13)
4.	Down in the dumps (4)	4.	Dizzy/lightheaded (19)	4.	Limited in sports/exercise (17)
5.	Relaxed (5)	5.	Restricted or limited (20)	5.	Unsure about exercise (21)
6.	Worn out (6)			6.	Overprotective family (22)
7.	Happy with personal life (7)			7.	Burden on others (23)
				8.	Excluded (24)
8.	Restless (8)			9.	Unable to socialise (25)
9.	Tearful (10)			10.	Physically restricted (26)
10.	Lack of self-confidence (15)				
11.	Frightened (18)				

The next two sections examine the PCA on this current sample. Using SPSS 17 for Windows, the PCA of the MacNew questionnaire in the UK sample was analysed using varimax rotation.

The results follow the following principles: (1) when an item falls in more than one component, then it will be positioned where it has the highest correlation coefficient, unless the correlation coefficient difference is less than .02, then the item will be dismissed, (2) the coefficient is rounded to the nearest two decimal digits, and (3) using guidelines from Stevens (2009) mentioned in section 7.2 above, only items that are similar to or higher than .45, are considered.

The MacNew questionnaire in the UK sample is suitable for PCA following a result of .73 using the Kaiser-Meyer-Olkin testing of sampling adequacy (KMO test). According to Pallant (2008), .60 or higher means the data set is suitable for factor analysis. Bartlett's test of sphericity shows a significant result ($p < .001$). The following section will proceed with PCA of the MacNew questionnaire in the UK sample. With eigenvalue set at 1.0, the result reveals nine factors. All of these three factors explain 68% of the variance.

In both the scree plot (Diagram 7.1.) and the rotated component matrix table produced by SPSS, the curve seems to reveal three components from this twenty-six item questionnaire.

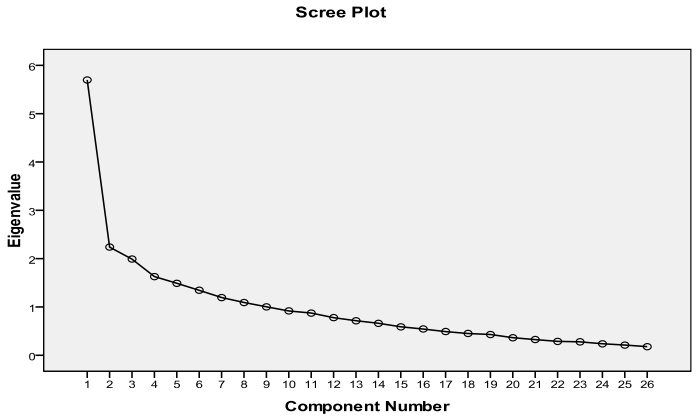

Diagram 7.1

Scree plot of the MacNew questionnaire in the UK sample

The components extracted in this analysis are presented in Table 7.2. Items with the highest correlation coefficient were 'down in the dumps', 'more dependent', 'worthless' and 'unable to socialise' (.65) and the lowest communality included are 'happy with personal life' and 'others/less confident in you' (.51). Items shown below are those with communalities of .40 or higher.

Table 7.2

Three components extracted from the MacNew questionnaire in the UK sample

	Component								
Items	1	2	3	4	5	6	7	8	9
Down in the dumps	**.65**								
More dependent	**.65**								
Worthless	**.65**								
Restricted or limited	**.63**								
Burden on others	**.62**								
Lacking of self confidence	**.61**								
Tearful	**.58**								
Chest pain	**.54**								
Frightened	**.51**								
Others/less confidence in you	**.51**								
Happy with personal life	**.48**								
Confident	**.48**								
Social activities	.								
Unable to socialize		**.65**							
Excluded		**.63**							
Physically restricted		**.63**							
Unsure about exercise			**.64**						
Sports/exercise limited			**.56**						
Aching legs			-.49	.50					
Relaxed or free of tension				.50					
Short of breath					-.62				
Dizzy/lightheaded						.62			
Frustrated						.40			
Restless							.61		
Overprotective family							.54	.53	
Worn out									.45

Some items did not meet the minimum communalities of .48, as suggested by Stevens (2009), such as, 'social activities', 'dizzy/lightheaded', 'worn out'). Therefore, these items are excluded from this analysis. A further two items are

also excluded, 'aching legs' and 'overprotective family' as even though these items meet the criteria set by Stevens (2009), they have two communalities with difference of less than .02. The first three major components are included because the rest of the six components had only one item. With twelve items, Factor I is called the *physical and emotional pain*, which accounts for 21.9% of the variance. Factor II with three items will be called *socially restricted* scale, which accounts for 8.6%. Finally, accounting for 7.7% is the third factor, *sport/exercise limitations*, with two items. These factor loadings is summarised in Table 7.3 below.

Table 7.3

Three-factor loading of the MacNew questionnaire in the UK sample

Factor I: **Physical and Emotional Pain**	**Factor II:** **Socially Restricted**	**Factor III:** **Exercise Limitations**
1. Down in the dumps	1. Unable to socialize	1. Unsure about exercise
2. More dependent	2. Physically restricted	2. Sports/exercise limited
2. Worthless	3. Excluded	
3. Restricted or limited		
4. Burden on others		
5. Lacking of self-confidence		
6. Tearful		
7. Chest pain		
8. Frightened		
9. Others/less confidence		
10. Happy with personal life		
11. Confident		

The UK sample shows a slight difference compared with the original three scales of the MacNew questionnaire (Dixon *et al*., 2002; Höfer, Lim, Guyatt, & Oldridge, 2004). The original *emotional* scales share seven out of eleven items in the *physical and emotional pain* scale of this study. The similar items are 'down in the dumps', 'worthless', 'lacking of self confidence', 'tearful', 'frightened', 'happy with personal life', and 'confident'. All three items in the *socially*

restricted and two items in *exercise limitations* were shared in the *social scale* of the original MacNew questionnaire study.

This analysis shows that there are differences in the components revealed by PCA between this sample and the Australia/UK sample in the original study (Dixon *et al*., 2002; Höfer *et al*., 2004). These differences may be due to the differences within these Western cultures. However, a further attempt is made to confirm whether these differences remain when each of the pure British-White group and combined British-Indian/Pakistani group are analysed.

7.3.1 *Principal component analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire in British ethnic groups*

This section analyses the components of the MacNew questionnaire in the different ethnic sub-samples and compares the result to the general sample in the UK study. British-Whites sample (n = 100) was the majority in the UK study.

This analysis begins by confirming the sampling adequacy of the British-White and combined British-Indian/Pakistani sample. The first group is at a moderate level to perform PCA. The result of the KMO test to measure the British-White sampling adequacy is .71. This measure reveals a good result and therefore it is adequate to continue with the analysis. However, the second group, the combined British-Indian/Pakistani is not adequate to perform this analysis. The KMO test is .31. This analysis reveals inadequate sampling to continue to PCA. Therefore, a further analysis below is conducted only for the British-White sample.

The rotated component matrix and scree plot (Diagram 7.2) for the British-White group refers to eight components (Table 7.4). Using eigenvalue 1.0, the rotate component matrix eight components are revealed in the MacNew questionnaire in the British-White group. These components explain 67% of the variance.

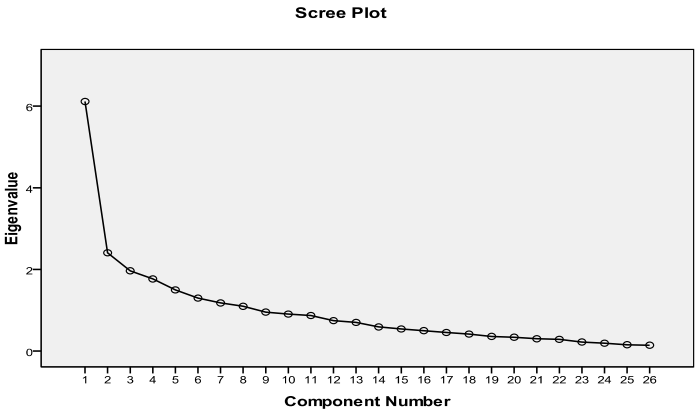

Diagram 7.2

Scree plot of the MacNew questionnaire in the British-White sample

The scree plot for in the British-white sample also shows the point of inflexion of the curve after eight points (Diagram 7.2). The curve is difficult to interpret it begins to tail off after four, eight and eleven points. The PCA revealed eight components, and therefore all will be retained. All items in Factor 2, 'unable to socialise' (.88), 'excluded' (.85) and 'physically restricted' (.85), have the highest communality of nearly .90. The lowest communalities included are 'lacking of self-confidence' and 'frustrated' at .56.

Table 7.4

Eight components extracted from the MacNew questionnaire in the UK sample

	Component							
Items	1	2	3	4	5	6	7	8
Worthless	**.79**							
Confident	**.68**							
Down in the dumps	**.64**							
More dependent	**.60**							
Tearful	**.59**					.47		
Worn out	.45							.40
Unable to socialize		**.88**						
Excluded		**.85**						
Physically restricted		**.85**						
Unsure about exercise			**.78**					
Restricted or limited			**.74**					
Sports/exercise limited			**.61**					
Burden on others	.51		**.57**					
Others/less confidence in you				**.73**				
Frightened			.42	**.58**				
Lacking of self confidence				**.56**				
Happy with personal life				.48		.44		
Aching leg					**.82**			
Chest pain					**.72**			
Relaxed or free of tension						**-.75**		
Short of breath						**.66**		
Restless							**.68**	
Dizzy/lightheaded							**.64**	
Frustrated							**.56**	
Overprotective family								**.81**
Social activities		.40						**.58**

The PCA for this questionnaire reveals a different result to the general UK sample in the previous chapter. Using guidelines by Stevens (2009) for samples equal to 100, only items with correlation coefficient higher than .51 will be included in this analysis. There are eight factors found (Table 7.5). The *emotional pain* contains five items, accounting for 23.5%. Three scales, *isolation* (9.3%), *mobility* (7.6%) and *self-esteem* (6.8%), each contains three items. With two items, the *physical pain* accounts for 5.8% and *tension* 5.0%. The seventh factor, *distress*, has three

items which accounts for 4.5%. Finally in the last factor, *social relations*, its two items explained for 4.2%.

Table 7.5

Eight-factor loading of the MacNew questionnaire in the British-Whites sample

Factor I: Emotional Pain	**Factor II: Isolation**	**Factor III: Mobility**	**Factor IV: Self-esteem**	**Factor V: Physical pain**	**Factor VI: Tension**	**Factor VII: Distress**	**Factor VIII: Social relations**
1. Worthless 2. Confident 3. Down in the dumps 4. More dependent 5. Tearful	1.Unable to socialise 2. Excluded 3.Physically restricted	1.Unsure about exercise 2.Restricted or limited 3.Sports/exercise limited	1.Others/less confident 2.Frightened 3.Lacking of self-confidence	1.Aching legs 2.Chest pain	1.NOT Relaxed or free of tension 2.Short of breath	1. Restless 2. Dizzy/ lightheaded 3.Frustrated	1.Overprotective family 2.Social activities

The objective of the PCA described here is to show how responsive the MacNew questionnaire is in this sample. However, this study will follow the original scales of this questionnaire in order to be able to compare it with the original study. The following section examines the reliability analysis of this questionnaire, including each of the *emotional*, *physical* and *social* scales.

From the above analysis, it can be concluded that pure British-White sample in this study responded differently to the general UK sample and the original study by Dixon *et al*. (2002) and Höfer *et al*. (2004). However, no further analysis of the combined British-Indian/Pakistani can be confirmed following testing of sampling adequacy due to low sample size.

7.4 Reliability and item analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire

The MacNew questionnaire in this study consists of 26 items, after omitting one item measuring sex. The average of these twenty-six items made up the general scale. All items were entered in the reliability analysis. Reliability of the MacNew questionnaire is analysed for each individual scale: emotional, physical and social. The average of every item on each scale for each case is computed using Cronbach's coefficient alpha method.

The MacNew questionnaire in the UK sample is found to be a very reliable tool. All cases (N = 130) were valid with a high reliability (α = .81). Removing the 'relaxed or free of tension', item would improve this reliability slightly up to .83 (Table 7.6). Removing any of the other items would result a lower or similar result, between .80 to .81. Therefore this procedure is not necessary.

Table 7.6

Item analysis of the MacNew questionnaire in the UK sample

Items	Cronbach's Alpha if Item Deleted
Frustrated	.81
Worthless	.80
Confident	.81
Down in the dumps	.80
Relaxed or free of tension	**.83**
Worn out	.81
Happy with personal life	.81
Restless	.81
Short of breath	.81
Tearful	.80
More dependent	.80
Social activities	.81
Others/less confidence in you	.80
Chest pain	.80
Lacking of self confidence	.80
Aching legs	.82
Sports/exercise limited	.81
Frightened	.81
Dizzy/lightheaded	.81
Restricted or limited	.80
Unsure about exercise	.81
Overprotective family	.82
Burden on others	.80
Excluded	.81
Unable to socialize	.81
Physically restricted	.80

Next is the reliability analysis of each of the three scales in the general UK sample. The Cronbach's coefficient alpha of the *emotional* scale is moderately high. Using the original three-factor loading with the original study of the MacNew (Dixon *et al*., 2002; Höfer *et al*., 2004), eleven items were entered to be analysed. The reliability analysis of the *emotional* scale shows a moderate Cronbach's coefficient alpha of .65. However, the reliability of this scale can be further improved (Table 7.7). Deleting 'relaxed or free of tension' items can produce a higher coefficient to .75.

Table 7.7

Item analysis of the emotional scale of the MacNew questionnaire in the UK sample

Items	Cronbach's Alpha if Item Deleted
Frustrated	.65
Worthless	.59
Confident	.60
Down in the dumps	.59
Relaxed or free of tension	**.75**
Worn out	.65
Happy with personal life	.63
Restless	.66
Tearful	.62
Lacking of self-confidence	.61
Frightened	.62

With ten items, the Cronbach's coefficient alpha for the *emotional* scale without 'relaxed or free of tension', the coefficient has increased from .65 to .75. Removing any other item would not improve the Cronbach's coefficient alpha substantially. Removing the 'restless' item, as shown in bold print, may improve the Cronbach's coefficient alpha by merely .01 point (Table 7.8). Removing any other item would decrease the reliability coefficient, or it would not change.

Table 7.8

Item analysis of the emotional scale of the MacNew questionnaire with the remaining ten items in the UK sample

Items	Cronbach's Alpha if Item Deleted
Frustrated	.75
Worthless	.70
Confident	.72
Down in the dumps	.69
Worn out	.75
Happy with personal life	.73
Restless	**.76**
Tearful	.72
Lacking of self-confidence	.72
Frightened	.73

The reliability analysis for the five-item *physical* scale produces a Cronbach's coefficient alpha of a moderate level (α = .63). This reliability would not improve significantly by further removing any item (Table 7.9). Without the 'short of breath' item, the Cronbach's coefficient alpha may improve slightly by .01.

Table 7.9

Item analysis of the physical scale of the MacNew questionnaire in the UK sample

Items	Cronbach's Alpha if Item Deleted
Short of breath	**.59**
Chest pain	.48
Aching legs	.55
Dizzy/lightheaded	.54
Restricted or limited	.48

Finally, ten items of the *social* scale of the MacNew questionnaire reveal a moderate level of reliability. A similar test was conducted for the ten-item Social scale. The result is of moderate reliability (α = .71). This Cronbach's coefficient alpha of the *social* scale will not improve any further. Removing any item would only jeopardise the reliability of this scale, or it will remain the same (Table 7.10).

Table 7.10

Item analysis of the social scale of the MacNew questionnaire in the UK sample

Items	Cronbach's Alpha if Item Deleted
More dependent	.68
Social activities	.70
Others/less confidence in you	.69
Sports/exercise limited	.69
Unsure about exercise	.70
Overprotective family	.71
Burden on others	.67
Excluded	.68
Unable to socialize	.68
Physically restricted	.63

From the reliability analysis above in the UK sample, it shows a moderate to high reliability. The reliability of scales of the MacNew questionnaire is at moderate level. *Physical* and *social* reach this level with all items similar to the original study, while one item, 'relaxed or free of tension' is omitted to reach this level in the *emotional* scale.

Similar to the PCA, the UK sample was analysed as a general group and then according to each ethnic sub-group: British-White and British-Indian-Pakistani. The following section analyses the scales of the MacNew questionnaire in the British-White group, followed by the British-Indian/Pakistani group.

Finally, the reliability analysis for the *social* scale will be presented. There are ten items in this particular scale. The reliability of this ten-item scale reveals a mixed result, high in the British-White group and poor in the British-Indian/Pakistani group. The reliability coefficient of the British-Whites is .75 and the British-Indian/Pakistani sample is .47.

7.4.1 *Reliability and item analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire in the British ethnic groups*

In this analysis, one hundred British-White participants were entered in this analysis and twenty-nine of the British-Indian/Pakistani participants. Twenty-six items of the MacNew questionnaire were analysed in this section. The results for both groups are shown simultaneously using split-cases.

The reliability of the MacNew questionnaire in the British-White and the British-Indian/Pakistani sample are both high. The Cronbach's coefficient alpha of this questionnaire in the British-White group is .83 and the British-Indian/Pakistani group .77. The reliability of both samples would not be improved substantially by losing an item (Table 7.11). For the British-White group, removing 'relaxed or

free of tension' would improve it merely by .02. Removing other items would not create any difference or might even lower the reliability. Similarly, in the British-Indian/Pakistani group, if the Cronbach's coefficient alpha results with 'confident' and/or 'social activities' were deleted it would only increase to .01 and therefore it is not necessary to perform another analysis without these items.

Table 7.11

Item analysis of the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	Frustrated	.83
	Worthless	.81
	Confident	.82
	Down in the dumps	.81
	Relaxed or free of tension	**.85**
	Worn out	.82
	Happy with personal life	.82
	Restless	.82
	Short of breath	.83
	Tearful	.82
	More dependent	.81
	Social activities	.82
	Others/less confidence in you	.82
	Chest pain	.82
	Lacking of self confidence	.82
	Aching legs	.83
	Sports/exercise limited	.82
	Frightened	.82
	Dizzy/lightheaded	.82
	Restricted or limited	.81
	Unsure about exercise	.82
	Overprotective family	.83
	Burden on others	.81
	Excluded	.82
	Unable to socialize	.82
	Physically restricted	.82

Indian/Pakistani	Frustrated	.76
	Worthless	.74
	Confident	**.78**
	Down in the dumps	.75
	Relaxed or free of tension	.77
	Worn out	.75
	Happy with personal life	.76
	Restless	.77
	Short of breath	.75
	Tearful	.75
	More dependent	.74
	Social activities	**.78**
	Others/less confidence in you	.76
	Chest pain	.74
	Lacking of self confidence	.75
	Aching legs	.76
	Sports/exercise limited	.77
	Frightened	.77
	Dizzy/lightheaded	.75
	Restricted or limited	.74
	Unsure about exercise	.77
	Overprotective family	.77
	Burden on others	.75
	Excluded	.76
	Unable to socialize	.76
	Physically restricted	.74

The next step is to analyse the reliability the *emotional, physical* and *social* scales two different sub-samples. The result of the eleven-item *emotional* scale is moderately high. The Cronbach's coefficient alpha for the British-Whites sample is .65 and in the British-Indian/Pakistani sample .63. However, this reliability can be improved further (Table 7.12). The Cronbach's coefficient alpha of the British-Whites sample can be improved to .75 and the British-Indian/Pakistani sample to .70 by removing the 'relaxed or free of tension' item.

Table 7.12

Item analysis of the emotional scale of the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	Frustrated	.65
	Worthless	.58
	Confident	.58
	Down in the dumps	.58
	Relaxed or free of tension	**.75**
	Worn out	.65
	Happy with personal life	.63
	Restless	.64
	Tearful	.61
	Lacking of self confidence	.61
	Frightened	.61
Indian/Pakistani	Frustrated	.61
	Worthless	.56
	Confident	.64
	Down in the dumps	.56
	Relaxed or free of tension	**.70**
	Worn out	.61
	Happy with personal life	.62
	Restless	.67
	Tearful	.57
	Lacking of self confidence	.57
	Frightened	.60

This attempt improved the reliability of the *emotional* scale of the MacNew questionnaire to a higher standard. The reliability coefficient for the British-White sample is now .75 and the British-Indian/Pakistani sample .70. The reliability of this scale would not be improved further by removing any item. The Cronbach's coefficient alpha of both groups may improve the British-White group by .01 and up to .04 in the British-Indian/Pakistani. However, further analysis would not be needed as the change would not be substantial.

Table 7.13

Item analysis of the emotional scale of the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	**Frustrated**	**.76**
	Worthless	.71
	Confident	.72
	Down in the dumps	.70
	Worn out	**.76**
	Happy with personal life	.74
	Restless	.75
	Tearful	.73
	Lacking of self confidence	.73
	Frightened	.73
Indian/Pakistani	Frustrated	.68
	Worthless	.64
	Confident	.70
	Down in the dumps	.63
	Worn out	.70
	Happy with personal life	.68
	Restless	**.74**
	Tearful	.64
	Lacking of self confidence	.64
	Frightened	.67

The next step is to test the reliability of the *physical* scale in the MacNew questionnaire in the British-White and British-Indian/Pakistani group. The *physical* scale has five items. The reliability of this scale is low for the British-White group and moderate for the British-Indian/Pakistani group. The Cronbach's coefficient alpha in the British-White sample is at a moderate level of .55 and .68 in the British-Indian/Pakistani sample. The reliability of the *physical* scale would not improve substantially by removing any item (Table 7.14). By removing the 'short of breath' item in the British-White sample, the Cronbach's coefficient alpha could be improved further by .01 point to .56, and without the 'aching legs'

item the alpha reliability would improve by .04 to .72 in the British-Indian/Pakistani sample. Therefore this further attempt is unnecessary.

Table 7.14

Item analysis of the physical scale of the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	**Short of breath**	**.56**
	Chest pain	.45
	Aching legs	.48
	Dizzy/lightheaded	.52
	Restricted or limited	.45
Indian/Pakistani	Short of breath	.67
	Chest pain	.57
	Aching leg	**.72**
	Dizzy/lightheaded	.60
	Restricted or limited	.57

Finally, the reliability analysis for the *social* scale is presented. There are ten items in this particular scale. The reliability of this ten-item scale reveals a mixed result, high in the British-White group and poor in the British-Indian/Pakistani group. The reliability coefficient of the British-Whites is .75 and in the British-Indian/Pakistani sample it is .47.

However, the reliability of the British-Indian/Pakistani group can be improved further (Table 7.15). The 'unsure about exercise' item will increase the Cronbach's coefficient alpha to .51 in the British-Indian/Pakistani sample. Therefore, this item will be excluded for both samples in the next analysis as an attempt to improve the reliability (Table 7.15). The PCA is suitable to conduct on the Brief-COPE in the UK sample. Based on KMO test, the sampling is moderately adequate (.65) and Bartlett's test is highly significant ($p < .00$). There

are nine components extracted in the Brief-COPE in the UK sample. These components explain around 68% of the variance.

Table 7.15

Item analysis of the social scale of the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	More dependent	.74
	Social activities	.74
	Others/less confidence in you	.74
	Sports/exercise limited	.73
	Unsure about exercise	**.74**
	Overprotective family	.76
	Burden on others	.72
	Excluded	.72
	Unable to socialize	.73
	Physically restricted	.69
Indian/Pakistani	More dependent	.40
	Social activities	.48
	Others/less confidence in you	.44
	Sports/exercise limited	.51
	Unsure about exercise	**.52**
	Overprotective family	.45
	Burden on others	.41
	Excluded	.46
	Unable to socialize	.43
	Physically restricted	.27

With the remaining nine items, the *social* scale without 'unsure about exercise' has increased the reliability in the British-Indian/Pakistani sample to .52. However, it has decreased the reliability of the British-White sample to .74. The reliability of this scale in the British-Indian/Pakistani without 'social activities' item would improved further by .06, based on this analysis (Table 7.16). Although without this item, the British-White group will not benefit further, there will be an improvement in the British-Indian/Pakistani group. Therefore, a further attempt is performed.

Table 7.16

Item analysis of the social scale with the remaining nine items in the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	More dependent	.72
	Social activities	**.71**
	Others/less confidence in you	.72
	Sports/exercise limited	.72
	Overprotective family	.75
	Burden on others	.70
	Excluded	.70
	Unable to socialize	.71
	Physically restricted	.67
Indian/Pakistani	More dependent	.43
	Social activities	**.58**
	Others/less confidence in you	.50
	Sports/exercise limited	.56
	Overprotective family	.52
	Burden on others	.44
	Excluded	.52
	Unable to socialize	.47
	Physically restricted	.32

The reliability of the *social* scale of the MacNew questionnaire in both samples, without 'unsure about exercise' and 'social activities' items, has improved the reliability of the British-Indian/Pakistani group (.58), but it has decreased slightly in the British-White group (.71). The reliability of the *social* scale, particularly for the British-Indian/Pakistani group can be improved further (Table 7.17). The Cronbach's coefficient alpha of the British-Indian/Pakistani group would increase by .07 by removing the 'others/less confidence in you' item; the British-White group decreases by .01.

Table 7.17

Item analysis of the social scale with the remaining eight items in the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	More dependent	.70
	Others/less confidence in you	**.70**
	Sports/exercise limited	.70
	Overprotective family	.74
	Burden on others	.66
	Excluded	.67
	Unable to socialize	.68
	Physically restricted	.63
Indian/Pakistani	More dependent	.48
	Others/less confidence in you	**.65**
	Sports/exercise limited	.62
	Overprotective family	.60
	Burden on others	.45
	Excluded	.57
	Unable to socialize	.49
	Physically restricted	.36

The reliability of the MacNew questionnaire in both British-White (α = .70) and British-Indian/Pakistani (α = .65) samples are at a moderate level. The Cronbach's coefficient alpha for the British-White sample has decreased by .05 from .75 with eight items. However, with seven items, the British-Indian/Pakistani has benefited with an increase from .58 to .65. Both samples' reliability would improve by .05 without the 'overprotective family' item (Table 7.18). Therefore 'others/less confidence in you'was removed in this further analysis.

Table 7.18

Item analysis of the social scale with the remaining seven items the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	More dependent	.69
	Sports/exercise limited	.69
	Overprotective family	**.73**
	Burden on others	.63
	Excluded	.64
	Unable to socialize	.66
	Physically restricted	.59
Indian/Pakistani	More dependent	.59
	Sports/exercise limited	.70
	Overprotective family	**.70**
	Burden on others	.52
	Excluded	.64
	Unable to socialize	.55
	Physically restricted	.46

With the remaining seven items, the reliability of the *social* scale of the MacNew questionnaire has improved to a moderate standard for the British-Indian/Pakistani group, but it has decreased slightly in the British-White group. By removing the 'sports/exercise limited' item, the reliability of both groups would benefit without this item (Table 7.19). A further attempt to improve the British-Indian/Pakistani group may improve the Cronbach's coefficient alpha from .70 to .78; and from .73 to .75 in the British-White.

Table 7.19

Item analysis of the social scale with the remaining six items in the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	More dependent	.73
	Sports/exercise limited	**.75**
	Burden on others	.69
	Excluded	.67
	Unable to socialize	.69
	Physically restricted	.62
Indian/Pakistani	More dependent	.62
	Sports/exercise limited	**.78**
	Burden on others	.56
	Excluded	.71
	Unable to socialize	.62
	Physically restricted	.57

This final attempt, with the remaining five items of the *social* scale has improved the reliability of both the British-White and the British-Indian/Pakistani group to a high level of reliability. The British-White now has a Cronbach's coefficient alpha of .75 and the British-Pakistani/Indian group .78. Although the reliability may improve slightly another attempt to remove an item may leave the scale with very few items in this scale. In the British-White group, the Cronbach's coefficient alpha would improve to .78; and .80 in the British-Indian/Pakistani group. Therefore, losing another item would not improve the reliability further.

Table 7.20

Item analysis of the social scale with the remaining five items in the MacNew questionnaire in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	**More dependent**	**.78**
	Burden on others	.72
	Excluded	.68
	Unable to socialize	.70
	Physically restricted	.63
Indian/Pakistani	More dependent	.73
	Burden on others	.67
	Excluded	**.80**
	Unable to socialize	.73
	Physically restricted	.70

The following section will analyse the PCA and reliability of another tool, the Brief-COPE.

7.5 Principal component analysis of the Brief-COPE

PCA of the twenty-eight items of the Brief-COPE shows a different result to that of the *a priori* scales Carver *et al*. (1989) study. The original scales were designed as a theoretically based fourteen-scale questionnaire, as explained in Chapter Three. Each of the following scales is represented by two items (Table 7.21).

Table 7.21

The fourteen scales of the original Brief-COPE (Carver, 1997)

Brief-COPE
1. Active Coping - Concentrating my efforts on doing something about the situation (2) - Taking action to try to make the situation better (7)
2. Planning - Trying to come up with a strategy about what to do (14) - Thinking hard about what steps to take (25)
3. Positive Reframing - Trying to see in different light (12) - Looking for something good in what happening (17)
4. Acceptance - Accepting the reality of the fact that it has happened (20) - Leaning to live with it (24)
5. Humour - Making jokes about it (18) - Making fun of the situation (28)
6. Spiritual/Religion - Trying to find comfort in my religion or spiritual beliefs (22) - Praying or meditating (27)
7. Using Emotional support - Getting emotional support from others (5) - Getting comfort and understanding from someone (15)
8. Using Instrumental support - Getting help and support from other people (10) - Trying to get advice or help from other people about what to do (23)
9. Self-Distraction - Turning to work and other activities (1) - Doing something to think about it less (19)
10. Denial - Saying to myself “this isn’t real”(3) - Refusing to believe that it has happened (8)
11. Venting - Saying things to myself to let my unpleasant feelings escape (9) - Expressing my negative feelings (21)
12. Substance Use - Using alcohol or other drugs to help me get through it (4) - Using alcohol or other drugs to make me feel better (11)
13. Behavioural Disengagement - Giving up trying to deal with it (6) - Giving up the attempt to cope (16)
14. Self-Blame - Criticising myself (13) - Blaming myself (26)

Regarding how many components are retained, the scree plot (Diagram 7.3) reveals two possibilities, which could either be four-factor loading or nine-factor loading.

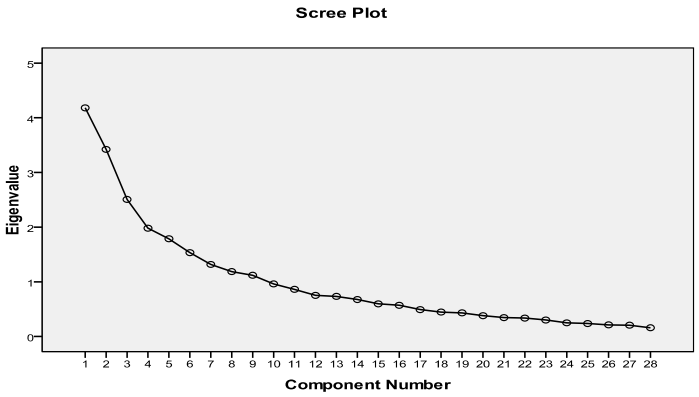

Diagram 7.3

Scree plot of the Brief-COPE in the UK sample

Similarly, the rotated component matrix also revealed nine-factor loading, compared with the *a priori* fourteen scales in the original Brief-COPE. Item analysis revealed that both items in the *spiritual* coping scale, 'trying to find comfort in my religion or spiritual beliefs' and 'praying or meditating', have high correlation coefficients of .90 (Table 7.21). Stevens (2009) consider this to be over highly correlated. The 'learning to live with it' item with the lowest correlation (.59) is included in the results.

Table 7.21

The fourteen scales of the original Brief-COPE (Carver et al., 1989)

Items	Component								
	1	2	3	4	5	6	7	8	9
Blaming myself for things that happened	**.77**								
Criticising myself	**.74**								
Thinking hard about what steps to take	**.63**								
Concentrating my efforts on doing something about the situation I'm in	**.61**								
Trying to come up with a strategy about what to do	.47			.41					
Giving up the attempt to cope	-.45								
Saying things to let my unpleasant feelings escape		**.81**							
Getting help and advice from other people		**.79**							
Expressing my negative feeling		**.77**							
Trying to get advice or help from other people about what to do		**.63**							
Giving up trying to deal with it			**.77**						
Saying to myself "this isn't real"			**.70**						
Refusing to believe that it has happened			**.68**						
Taking action to try to make the situation better	.43		-.48						
Looking for something good in what is happening				**.72**					
Accepting the reality of the fact that it has happened				**.68**					
Learning to live with it				**.59**					
Trying to see in a different light, to make it more positive				.44					
Using alcohol or other drugs to help me get through it					**.88**				
Using alcohol or other drugs to make myself feel better					**.74**				
Trying to find comfort in my religion or spiritual beliefs						**.90**			
Praying or meditating						**.90**			
Turning to work or other activities to take my mind off things							**.84**		
Doing something to think about it less							**.65**		
Getting emotional support from others								**.84**	
Getting comfort and understanding from someone								**.63**	
Making jokes about it									**.83**
Making fun of the situation									**.79**

In comparison to the original study of the Brief-COPE (Carver, 1997), in coping among the victims of Hurricane Andrew, four *a priori* scales formed four different factors: *substance use* coping, *spiritual* coping, *humour* coping, and *behavioural disengagement* coping. In this analysis, three of these also appear as distinct factors: *substance use* coping, *spiritual* coping and *humour* coping. However,

using emotional support coping and *using instrumental support* coping were merged as a single factor in the original study by Carver (1997). In this study, *using emotional support* coping formed a different factor, while *using instrumental support* coping merged as a single factor with *venting* coping. Furthermore, four out of twenty-eight items do not meet the minimum loading of .45 as set by Stevens (2009), i.e. 'trying to come up with a strategy', 'giving up the attempt to cope', 'taking action to make the situation better', and 'trying to see in a different light'.

The components of the Brief-COPE in the UK sample showed that some factors share similarities with the original *a priori* scales (Table 7.23). Whenever possible, the name of the scale will be retained. The nine-factor loadings are named according to the grouping of items. Factor I, with four items, will be called *approach coping* scale which accounts for 14.9% of the variance. Factor II (12.2%) will be called *venting and using instrumental support* coping scale as it represents the *venting* coping scale and *using instrumental support* coping scale in the original findings. Factor III (9%) will be called *avoidance coping* scale and Factor IV (7.1%) is called *positive outlook* coping scale. The rest of the four factors were similar to the original scales of the Brief-COPE (Carver, 1997) and therefore, their names will remain; Factor V (6.4%) is called *substance use* coping scale, Factor VI (5.5%) is the *spiritual* coping scale and Factor VII (4.7%) is *self-distraction* coping scale. Finally, Factor VIII is identical to the *using emotional support* coping scale and it explains 4.2% of the variance, and Factor IX is identical to *humour* coping scale, and this scale explains 4%.

Table 7.23

Nine-factor loading of the Brief-COPE in the UK sample

Factor I: Approach Coping (α = .74)	**Factor II: Venting & Using Instrumental Support (α = .78)**	**Factor III: Avoidance Coping (α = .64)**	**Factor IV: Positive Outlook (α = .56)**	**Factor V: Substance Use (α = .74)**	**Factor VI: Spiritual (α = .84)**	**Factor VII: Self-Distraction (α = .58)**	**Factor VIII: Using Emotional Support (α = .72)**	**Factor IX: Humour (α = .73)**
Blaming myself for things that happened	Saying things to let my unpleasant feelings escape	Giving up trying to deal with it	Looking for something good in what is happening	Using alcohol or other drugs to help me get through it	Trying to find comfort in my religion or spiritual beliefs	Turning to work or other activities to take my mind off things	Getting emotional support from others	Making jokes about it
Criticising myself	Getting help and advice from other people	Saying to myself "this isn't real"	Accepting the reality of the fact that it has happened	Using alcohol or other drugs to make myself feel better	Praying or meditating	Doing something to think about it less	Getting comfort and under-standing from someone	Making fun of the situation
Thinking hard about what steps to take	Expressing my negative feelings	Refusing to believe that it has happened	Learning to live with it					
Concentrating my efforts on doing something about the situation I'm in	Trying to get advice or help from other people about what to do							

Reliability analyses were conducted on all of the above scales. The UK sample produced moderate to low reliability with all scales exceeding .05. The reliability ranged from .84 for *spiritual* coping to .56 for *positive outlook* coping scale. All results were unable to be improved by deleting any items. These results are similar results to those found in the original Brief-COPE. Of the five scales similar to the original study by Carver (1997), *spiritual* coping scale (α = 82), *using emotional support* coping scale (α = .71) and *humour* coping scale (α = .73) shared similar results to this study. In this study, both *substance use* coping scale (α = .90) and *self-distraction* coping scale (α = 71) were found to have a lower reliability than in the original Brief-COPE study.

7.5.1 *Reliability and item analysis of the Brief-COPE in the British ethnic groups*

In this analysis, twenty-eight items of the Brief-COPE were analysed. One hundred British-White participants were entered in this analysis and twenty-nine of the British-Indian/Pakistani participants and the results for both groups are shown simultaneously, analysed using split-cases. One British-African candidate is excluded from the following analysis.

The reliability of the Brief-COPE in the British-White and the British-Indian/Pakistani sample are both at a moderate level. The Cronbach's coefficient alpha in the British-White group is .60 and in the British-Indian/Pakistani group .69. The reliability of both samples would not be improved substantially by losing any item. For the British-White group removing 'giving up trying to deal with it' or 'giving up the attempt to cope' would only increase the Cronbach's coefficient alpha by .01. Removing other items would not create any difference or might even lower the reliability. Similarly, in the British-Indian/Pakistani group Cronbach's coefficient alpha results, if 'giving up the attempt to cope' or 'making fun of the situation' were deleted, it would only increase to .03. Therefore no further attempt to improve the reliability of the Brief-COPE was performed.

Table 7.24

Item analysis of the Brief-COPE in the British-White and British-Indian/Pakistani sample

Ethnicity		Cronbach's Alpha if Item Deleted
Whites	Turning to work or other activities to take my mind off things	.60
	Concentrating my efforts on doing something about the situation I'm in	.59
	Saying to myself "this isn't real"	.59
	Using alcohol or other drugs to make myself feel better	.59
	Getting emotional support from others	.57
	Giving up trying to deal with it	**.61**
	Taking action to try to make the situation better	.59
	Refusing to believe that it has happened	.62
	Saying things to let my unpleasant feelings escape	.57
	Getting help and advice from other people	.57
	Using alcohol or other drugs to help me get through it	.59
	Trying to see in a different light, to make it more positive	.57
	Criticizing myself	.60
	Trying to come up with a strategy about what to do	.57
	Getting comfort and understanding from someone	.57
	Giving up the attempt to cope	**.61**
	Looking for something good in what is happening	.56
	Making jokes about it	.59
	Doing something to think about it less	.60
	Accepting the reality of the fact that it has happened	.60
	Expressing my negative feeling	.56
	Trying to find comfort in my religion or spiritual beliefs	.58
	Trying to get advice or help from other people about what to do	.55
	Learning to live with it	.58
	Thinking hard about what steps to take	.59
	Blaming myself for things that happened	.59
	Praying or meditating	.58
	Making fun of the situation	.61

Indian/Pakistani	Turning to work or other activities to take my mind off things	.69
	Concentrating my efforts on doing something about the situation I'm in	.67
	Saying to myself "this isn't real"	.68
	Using alcohol or other drugs to make myself feel better	.68
	Getting emotional support from others	.66
	Giving up trying to deal with it	.67
	Taking action to try to make the situation better	.64
	Refusing to believe that it has happened	.69
	Saying things to let my unpleasant feelings escape	.66
	Getting help and advice from other people	.66
	Trying to see in a different light	.68
	Criticising myself	.65
	Trying to come up with a strategy about what to do	.68
	Getting comfort and understanding from someone	.67
	Giving up the attempt to cope	**.70**
	Looking for something food in what is happening	.68
	Making jokes about it	.68
	Doing something to think about it less	.66
	Accepting the reality of the fact that it has happened	.66
	Expressing my negative feeling	.65
	Trying to find comfort in my religion or spiritual beliefs	.64
	Trying to get advice or help from other people about what to do	.65
	Learning to live with it	.67
	Thinking hard about what steps to take	.67
	Blaming myself for things that happened	.67
	Praying or meditating	.68
	Making fun of the situation	**.70**

7.6 Conclusion

As stated in the beginning of this chapter, the aim of this chapter is to test the measurements used in this study when measured in the UK sample. In the first measurement, the MacNew questionnaire revealed different components from the original version (Dixon *et al*., 2002). There are three scales in the latter, six scales found in the UK. This may have been due to lower sample size in this current

study. The original study (Dixon *et al*., 2002) used 1506 participants with different types of heart disease, including 346 individuals with heart attack in the US. The heart attack cases included in this current study was 130 individuals, less than half of the original one. When forced to show a similar result to the original version with three factors, the result was not very different from the latter. In the second measurement, the Brief-COPE, revealed a similar result to the original Brief-COPE study (Carver, 1997). Some of the scales revealed were identical.

The following chapter analysed the psychometric properties of the MacNew questionnaire and the Brief-COPE similar to the analyses in this chapter, in the Indonesian sample. The following chapter will also include the discussion of the results in Part Three.

CHAPTER 8 THE INDONESIAN SAMPLE MEASURES

8.1 Introduction

Following the objectives in section 6.2, and similar to the previous chapter, the aim of this chapter is to test the measurements used in this study when measured in the Indonesian sample. This chapter assesses the responsiveness of the Brief-COPE and the MacNew questionnaire when administered to the specific populations of people with heart attack living in Jakarta, Indonesia. As stated in the introduction to the previous chapter, the B-IPQ contains eight sub-scales using one item for each, so it was not possible to conduct factor analysis and PCA.

The population of this study is people with a recent heart attack. Similarly to the UK study, the sample in this preliminary analysis is the same as the sample in the cross-cultural study, explained in the next chapter. More details of this sample are presented in section 6.5.2.

8.2 Principal component analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire

PCA of the MacNew questionnaire is reported using the guidelines set out in section 6.8. Using varimax rotation, the MacNew questionnaire in the Indonesian sample is found to be suitable for PCA. The KMO test revealed a moderate sampling adequacy (.69) and significant level in the Bartlett's test ($p < .001$). See table 7.3 for a summary of the original scales of the MacNew questionnaire.

Therefore, the following section will proceed with PCA of the MacNew questionnaire in the Indonesian sample. Using eigenvalue greater than 0.1, the result of the PCA using the Indonesian version is similar to the result in the UK sample, with a nine-factor solution explaining 68.4% of the total variance in responses.

There are mixed results from scree plot (Diagram 8.1) and rotated component matrix. The curve in the scree plot for the MacNew questionnaire, inflexed after four and nine points; whilst the rotated component matrix table revealed nine components.

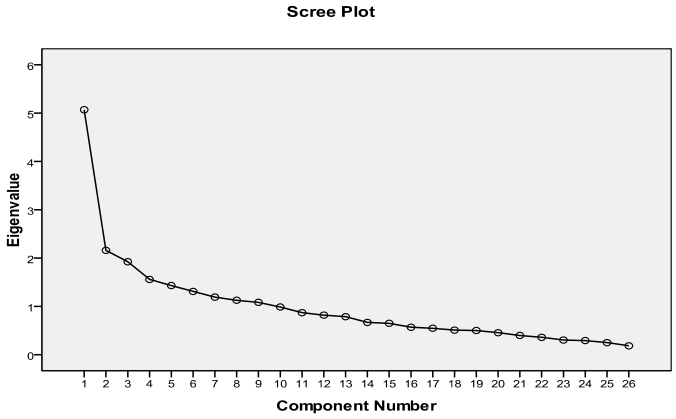

Diagram 8.1

Scree plot of the MacNew questionnaire

Table 8.1 below suggests there are four components following the guidelines. The four-factor loadings in this study, with the highest correlation coefficient are 'restless' (.78), and the lowest is 'worthless' (.49).

Table 8.1

Four components extracted from the MacNew questionnaire in the Indonesian sample

	Component								
Items	1	2	3	4	5	6	7	8	9
Unsure about exercise	**.76**								
Restricted or limited	**.74**								
Sports/exercise limited	**.64**							.40	
Frightened	**.55**								
Short of breath	**.55**								
Social activities	.47		.43						
Restless		**.78**							
Happy with personal life		**.76**							
Frustrated		**.61**							
Worthless		.49							.40
Lacking of self-confidence		.43							
Others/less confidence in you		.42							
Unable to socialize			**.80**						
Excluded			**.73**						
Aching leg				**.69**					
Worn out				**.66**					
Tearful		.45		.48					
Chest pain				.47	.41				
Burden on others					**.79**				
More dependent					**.77**				
Confident						**.79**			
Dizzy/lightheaded				.44		**.53**			
Down in the dumps							-.88		
Physically restricted								.72	
Relaxed or free of tension						.42		.48	
Overprotective family									.76

Only about half of the items meet the minimum communalities requirements, set by Stevens (2009) of .487 based a sample size of 113. Factors VII and IX contain only one valid single item each, and will therefore be dismissed. Also, seven items do not meet the desired correlation coefficient .51, i.e., 'social activities', 'worthless', 'lacking of self-confidence', 'tearful', 'chest pain', 'others/less confident', 'relaxed or free of tension' so these will not be considered in the results. Therefore, Factors VI, VII and VIII will also be dismissed as one-item

factors. Only five remaining factors will be considered. Factors IV, V and VI have two items.

These remaining five factors will be referred to as follows. As its five items are related to physical, this factor will be called *physical activities* scale. This scale explains 16% of the variance. Factor II explains 10% and will be referred to as *emotional* scale and Factor III is *socialising* scale explaining 8% of the variance. Finally, two items, 'burden on others' and 'more dependent' are grouped in Factor IV, which will be referred to as *dependency* scale and it explains 6% of the variance. Only ten items retained following this procedure out of twenty-six items in the original study.

Table 8.2

Four-factor loading from the MacNew questionnaire in the Indonesian sample

Factor I: Physical Activities	**Factor II: Emotional**	**Factor III: Socialising**	**Factor IV: Dependency**
1. Unsure about exercise	1. Restless	1. Unable to socialise	1. Burden on others
2. Restricted or limited	2. Happy with personal life	2. Excluded	2. More Dependent
3. Sports/exercise limited	3. Frustrated	3. Aching legs	
4. Frightened	4. Worthless	4. Worn out	
5. Short of breath			

There are similarities between the *physical, emotional* and *dependency* scales in this sample, and the *emotional and physical pain* scale in the general UK sample. Seven out of eleven items in the *physical and emotional restriction* scale are also in the results of the general UK sample. The shared items are: 'frightened', 'others/less confidence in you', 'restricted or limited', 'lack of self-confidence', 'chest pain', 'worthless' and 'tearful'. Both the 'burden on others' and 'more dependent' items are reverse items with negative correlations. Three of four items

in the *socialising* scale are similar to the *socially restricted* scale in the UK sample.

In this study, PCA shows a slightly different result to the original MacNew (Dixon *et al*., 2002; Höfer *et al*., 2004). As explained below, the Indonesian sample yielded four-factor loading. Therefore, there was an attempt to force entry each of these samples to three-factor solutions similar to the original version in the following section.

8.2.1 *Forced three-factor solution for the Indonesian sample*

To examine whether the same three-factor solution from the original questionnaire could be replicated in the Indonesian version, a PCA with a varimax rotation to a forced three numbers of factor solution was conducted (Table 8.3).

Table 8.3

Item analysis of the Brief-COPE in the Indonesian sample

Items	Component		
	1	2	3
Frightened	**.69**		
Others/less confidence in you	**.66**		
Restricted or limited	**.60**		
Lacking of self confidence	**.59**		
Frustrated	**.55**		
Unsure about exercise	.50		
Chest pain	.50		
Dizzy/lightheaded	.49		
Social activities	.49		
Worthless	.49		
Tearful	.47		
Short of breath	.42		
More dependent	.41		
Physically restricted	.38		
Worn out	.38		
Burden on others			
Down in the dumps			
Overprotective family			
Happy with personal life		**.60**	
Restless		**.56**	
Relaxed or free of tension		.46	
Sports/exercise limited		-.44	
Excluded			**-.70**
Unable to socialise			**-.51**
Confident			
Aching legs			

This attempt resulted in similarity to the previous result in the Indonesian sample. There were no changes in the *physical* and *emotional* scales (Table 8.4).

Table 8.4

Forced three-factor loading of the MacNew questionnaire in the Indonesian sample

Factor I: Physical	Factor II: Emotional	Factor III: Social
1. Frightened	1. Restless	1. Excluded
2. Others/less confidence in you	2. Happy with	2. Unable to
2. Restricted or limited	personal life	socialise
3. Lacking of self-confidence	3. Relaxed or free of tension	
4. Frustrated		

In comparison with the previous factor analysis conducted on a Western sample (Dixon *et al*., 2002; Höfer *et al*., 2004), although it produced more factors, this study reveals a similar result. Therefore, in both of the Indonesian and the UK samples, the original three-factor loading will be used. The reason for this decision is to enable comparison with the previous findings. These differences may reflect cultural differences and/or simply a language translation barrier.

8.3 Reliability analysis of the MacNew Heart Disease Health-Related Quality of Life questionnaire

Reliability of the MacNew questionnaire is analysed in general, as well as for each individual scale, i.e. *emotional*, *physical* and *social*. The average of every item on each scale for each case is computed. Similar to the UK sample, the MacNew questionnaire in this study consists of twenty-six items. All 113 cases were valid in this analysis.

The following sections assess the reliability of the MacNew questionnaire, followed by the reliability analysis of its scales. The reliability analysis of the MacNew questionnaire shows a good result. The Cronbach's coefficient alpha of the twenty-six items is .78.

The next step is to calculate the reliability of the three scales of the MacNew questionnaire; the *emotional*, *physical* and *social*. The eleven items of the *emotional* scale have a moderate level of reliability. The Cronbach's coefficient alpha of this scale is .65. The reliability analysis of this scale can be improved (Table 8.6). The results show that by removing the 'down in the dumps' item, the Cronbach's coefficient alpha can increase to .72.

Table 8.6

Item analysis of the emotional scale in the MacNew questionnaire in the Indonesian sample

Items	Cronbach's Alpha if Item Deleted
Frustrated	.59
Worthless	.61
Confident	.66
Down in the dumps	**.72**
Relaxed or free of tension	.63
Worn out	.63
Happy with personal life	.61
Restless	.57
Tearful	.60
Lacking of self confidence	.61
Frightened	.61

Without the 'confident' item, the reliability could improve slightly, but not substantially. By removing this item, the Cronbach's coefficient alpha would increase only slightly from .72 to .74. Therefore, no further attempt is necessary to change the reliability of the *emotional* scale.

Table 8.7

Item analysis of the emotional scale with the remaining ten items in the MacNew questionnaire in the Indonesian sample

Items	Cronbach's Alpha if Item Deleted
Frustrated	.68
Worthless	.69
Confident	**.74**
Relaxed or free of tension	.72
Worn out	.71
Happy with personal life	.69
Restless	.66
Tearful	.69
Lacking of self confidence	.69
Frightened	.69

The following step is to calculate the reliability of the *physical* scale. The reliability analysis of the five-items in this scale is found to be at a moderate level. The Cronbach's coefficient alpha is .61.

The reliability of this scale of the MacNew questionnaire can be improved slightly (Table 8.8). The Cronbach's coefficient alpha is .61 which can improve by .06 to .67 by removing the 'aching legs' item. Therefore, this item will be removed in the subsequent analysis.

Table 8.8

Item analysis of the physical scale of the MacNew questionnaire in the Indonesian sample

Items	Cronbach's Alpha if Item Deleted
Short of breath	.56
Chest pain	.50
Aching leg	**.67**
Dizzy/lightheaded	.51
Restricted or limited	.56

The reliability of the *physical* scale with of the MacNew questionnaire with four items has improved slightly. The Cronbach's coefficient alpha of this scale without the 'aching legs' item is now .67. This reliability is the highest this scale can perform in this particular sample. Removing any other item would not improve the Cronbach's coefficient alpha.

Table 8.9

Item analysis of the physical scale with the remaining of five items in the MacNew questionnaire in the Indonesian sample

Items	Cronbach's Alpha if Item Deleted
Short of breath	.63
Chest pain	.59
Dizzy/lightheaded	.58
Restricted or limited	.61

The reliability of the *social* scale of the MacNew questionnaire is at a moderate level. The Cronbach's coefficient alpha is .64 with ten items. This reliability could improve slightly (Table 8.10). The Cronbach's coefficient alpha of this scale would improve only by .02 with nine items, without the 'overprotective family' item. Therefore, no further attempt will be performed to improve the reliability of this scale.

Table 8.10

Item analysis of the social scale of the MacNew questionnaire in the Indonesian sample

Items	Cronbach's Alpha if Item Deleted
More dependent	.62
Social activities	.59
Others/less confidence in you	.58
Sports/exercise limited	.63
Unsure about exercise	.60
Overprotective family	**.66**
Burden on others	.61
Excluded	.59
Unable to socialize	.63
Physically restricted	.63

The next section analyses the Brief-COPE. The analysis begins with PCA and is followed by reliability and item analysis of this scale in the Indonesian sample.

8.3.1 *Principal component analysis of the Brief-COPE*

The sample was sufficient for PCA of the Brief-COPE, based on the KMO test showing moderate sampling (.61). The result of the PCA using the Indonesian version using eigenvalue greater than 1.0 resulted in ten factors, which explains 68.4% of the variance in responses. The scree plot shows the inflexion of the curve with possibilities in several places; after five, and similarly to the total variance explained table above, ten components.

The PCA revealed eight factors, compared with the fourteen *a priori* scales from the original scales, to be retained (Table 8.11). The highest correlation coefficient is 'concentrating my efforts on doing something about the situation I'm in' and 'taking action to try to make the situation better' (.84), and the lowest is 'getting emotional support from others' (.52).

Table 8.11

Item analysis of the Brief-COPE in the Indonesian sample

Items	Component									
	1	2	3	4	5	6	7	8	9	10
Concentrating my efforts on doing something about the situation I'm in	**.84**									
Taking action to try to make the situation better	**.84**									
Giving up trying to deal with it	**-.56**									
Thinking hard about what steps to take	**.55**									
Getting help and advice from other people		**.78**								
Trying to get advice or help from other people about what to do		**.77**								
Expressing my negative feeling		**.64**								
Getting comfort and understanding from someone		**.59**								
Getting emotional support from others		**.52**								
Looking for something good in what is happening			**.71**							
Trying to see in a different light, to make it more positive			**.65**							
Accepting the reality of the fact that it has happened			**.63**							
Learning to live with it			.47				-.45			
Praying or meditating				**.88**						
Trying to find comfort in my religion or spiritual beliefs				**.83**						
Making fun of the situation					**.90**					
Making jokes about it					**.85**					
Blaming myself for things that happened						**.83**				
Criticising myself						**.80**				
Using alcohol or other drugs to help me get through it							**.75**			
Saying to myself "this isn't real"							**.66**			
Giving up the attempt to cope							**.48**	.44		
Using alcohol or other drugs to make myself feel better								**-.71**		
Refusing to believe that it has happened								**.50**		
Doing something to think about it less								.43		
Saying things to let my unpleasant feelings escape									.84	
Trying to come up with a strategy about what to do										**.56**
Turning to work or other activities to take my mind off things	-.43									**.55**

These new scales produced from the Indonesian version of Brief-COPE are labelled according to the original *a priori* scales to easily identify with these original scales. Twenty-two out of twenty-eight items were included.

Table 8.12

Nine-factor loading from the Brief-COPE in the Indonesian sample

Factor I: Active Coping	**Factor II: Seeking Support**	**Factor III: Positive Outlook**	**Factor IV: Spiritual**	**Factor V: Humour**	**Factor VI: Self-blame**	**Factor VII: Substance use & Denial**	**Factor VIII: NOT Using Substance & Denial**	**Factor IX: Keeping Busy**
Concentrating my efforts on doing something	Getting help and advice from other people	Looking for something good in what is happening	Praying or meditating	Making fun of the situation	Blaming myself for things that happened	Using alcohol or other drugs to help me get through it	NOT Using alcohol or other drugs to make myself feel better	Trying to come up with a strategy about what to do
Taking action to try to make the situation better	Trying to get advice or help from other people about what to do	Trying to see in a different light, to make it more positive	Trying to find comfort in my religion or spiritual beliefs	Making jokes about it	Criticising myself	Saying to myself "this isn't real"	Refusing to believe that it has happened	Turning to work or other activities to take my mind off things
NOT Giving up trying to deal with it	Expressing my negative feeling	Accepting the reality of the fact that it has happened				Giving up the attempt to Cope		
Thinking hard about what steps to take	Getting comfort and understanding from someone							
	Getting emotional support from others							

The adapted Brief-COPE for the Indonesian sample yielded some similar scales, but there is some overlap of these scales which produced fewer scales. Factor IV yielded a similar result to *spiritual* coping scale, Factor V to *humour* coping scale and Factor VI to the *self-blame* coping scale. Factors VII and VIII produced a similar mix of *substance use* coping scale and *denial* coping scale in the *a priori* scales, with one reverse item in Factor VII. Factor I shares all items in the *active coping* scale of the *a priori* scales, as well as an item from the *planning* coping scale and a reverse item from the *behavioural disengagement* coping scale. Therefore, Factor I will be labelled *active coping* scale and it is explaining 16% of the total variance. Factor II, labelled *seeking support* coping scale shares with Instrumental Support in the *a priori* scales, as well as one item from each *using emotional support* and *venting* coping scales. With five items, it explains 10% of the total variance. Factor III is *positive outlook* coping scale, explaining 8%, as it has all items from the *positive reframing* coping scale and one item from the *acceptance* coping scale. The remaining six factors each have two items. Factor IV (6%), Factor V (6%) and Factor VI (5%) shared similarities to the *a priori*

scales. Factor VII (5%) and Factor VIII (5%) each share each half of *substance use* and *denial* coping scales. Another item, *planning* coping scale is in Factor X along with one item from the *self-distraction* coping scale. This factor will be labelled as *keeping busy* coping scale and it explains 4% of the total variance.

The reliability of the Brief-COPE in this sample is explored. With only two items, *spiritual*, *humour* and *self-blame* coping scales will not be included in the following analysis.

Similarly to the UK sample, the reliability of the three scales in the Indonesian sample reveal moderate to low consistencies. The 'giving up trying to deal with it' item is recoded for the *active coping* scale. The *active coping* scale ($\alpha = .75$) and *seeking support* coping scale ($\alpha = .74$) have acceptable levels of consistency. However, the *positive outlook* coping scale has a low reliability of .57.

8.4 Discussion

As stated in the beginning of this chapter, the objective of this chapter is to test the measurements used in this study when measured in the Eastern sample, particularly the Indonesian sample.

In the first measurement, the MacNew questionnaire, analysis revealed different components to the original version (Dixon *et al*., 2002). It has been shown that adaptations to the MacNew questionnaire have altered the content of the scales when translated to other Western European languages: Dutch, German, Spanish; and Farsi (Persian), compared with the original version in the US (Höfer *et al*., 2004). These differences reflect cultural differences in interpreting an item.

Using the four scales of the Indonesian and the UK version, the mapping of these scales that was performed is included in the analysis by Höfer *et al*. (2004) (Table

7.25). They included items with factor loadings at or above .40. The first three scales of the Indonesian and the UK version were included. The Indonesian version has fifteen items (see Table 8.1) and the UK has sixteen items (Table 7.1) with loadings .40 or higher. In the UK version, the *physical and emotional pain* scale performed similarly to the *emotional* scale in the original, socially restricted is similar to the *physical* scale, and exercise limitations to the *social* scale.

Table 7.25

Item as allocated to each domain the original English version (v), *the Dutch (D), Farsi (F), Spanish (S), and the UK and Indonesian version of the MacNew*

Items	Emotional		Physical		Social	
1. Frustrated	V	D,G,S,**IND**				F
2. Worthless	V	D,G,**IND,UK**				F,S
3. Confident	V	D,G,S,**UK**		F		
4. Down in the dumps	V	D,G,S,**UK**				F
5. Relaxed	V	D,F,G,S				
6. Worn out	V	S,**UK**		D,G		F,**IND**
7. Happy with personal life	V	D,F,G,S,**IND,UK**				
8. Restless	V	D,F,G,S,**IND**				
9. Short of breath			V	D,F,G,S,**IND**		
10. Tearful	V	D,G,**UK**				F,S
11. More dependent		**UK**			V	D,F,S
12. Social activities		G,**IND**			V	D,F,G,S
13. Other/less confident in you		**IND,UK**			V	D,F,S
14. Chest pain		**UK**	V	D,G,S		F,
15. Lack of self-confidence	V	D,G,**IND,UK**				F,S
16. Aching legs			V	D,F,G,S,**IND**		**IND**
17. Sports/exercise limited				D,S, **IND**	V	F,G,**UK**
18. Frightened	V	D,G,**UK**		F, **IND**		S
19. Dizzy/lightheaded		S	V	D,G		
20. Restricted or limited		**UK**	V	D,S,**IND**		F,G
21. Unsure about exercise				D,S	V	F,G,**UK**
22. Overprotective family					V	D,G,S
23. Burden on others		**UK**			V	D,F,G,S
24. Excluded				S	V	F,G,**IND**
25. Unable to socialise				**UK**	V	F,G,S,**IND**
26. Physically restricted				S	V	F,G

Source: Höfer *et al*., (2004)

There are some items which are interpreted in a similar way in most cultures. 'Happy with personal life' and 'restless' of the *emotional* scale, 'short of breath' and 'aching legs' of the *physical* scale, are constantly performing well in all versions. The items of the UK version performed differently compared with the other versions. 'More dependent', 'other/less confident in you', 'chest pain', 'restricted or limited' and 'burden on others' in the *emotional* scale and 'unable to socialise' in the *physical* scale. The Farsi version is also performing somewhat different from the rest.

As mentioned in the previous chapter, there is a difference in the sample size used in this assessment. The sample size of this heart attack study (n_{Uk} = 130 and $n_{Indonesia}$ = 113) is less than half of heart attack participants in the original sample (n = 346) in the US, with the total sample of 1506.

The Brief-COPE, PCA yielded a different result to the *a priori* scales proposed by Carver *et al*. (1989), suggesting there could be fewer scales than they proposed. Carver explains on his website (www.psy.miami.edu/faculty/ccarver) that although his PCA revealed nine factors, which is consistent with both the UK and Indonesian samples, he is pursuing the *a priori* scales. The Indonesian version of the Brief-COPE in this PCA has some similarities to the results of PCA in the original version by Carver *et al*. (1989). Carver *et al*. (1989) found nine factors which account for 72% of the variance compared to 68% of the total variance in this sample. However, they ignored these components extracted and chose to use their *a priori* scales instead.

Compared with the UK sample, two factors are consistent with the *a priori* scales: *spiritual* coping and *humour* coping scales. In addition, the *self-blame* coping scales also appear on its own in the Indonesian sample, which does not appear as a stand-alone component in the UK sample. In this sample, the *self-blame* coping scale appeared along with *active coping* in the *approach* coping scale. In the

Indonesian sample, the *active coping* scale also came up with two additional items: 'taking action to make the situation better', and a reverse item 'NOT giving up the attempt to cope'.

The psychometric analysis of the Brief-COPE in the Indonesian sample suggests that self-blame is a characteristic that is salient to the Eastern culture. Self-blame is related to self-conscious emotions, guilt (Smith & Lazarus, 1993). Self-blame is produced by the interpretation of an event, and not produced by any specific situation (Lewis, 2008). Guilt and shame have been used interchangeably. Guilt is an affective state most often associated with a focus on some past behaviours, which the subject finds inconsistent with a set of internalised standards; shame focuses on the entire self, not so much on specific behaviours and is related to the social judgments of others (Tangney, 1995). Shame and guilt have been found to be salient to Eastern culture, for example in Japanese people (Lebra, 1983). The characterological of shame and guilt in the Eastern sample may be heightened by feelings toward being a financial and carer burden on the family. In the UK sample where healthcare is free, these feelings are not salient.

The *seeking support* coping scale in this sample consisted of *using emotional support* coping scale, *using instrumental support* coping scale and one item from the *venting* coping scale. This new scale suggests that in this culture, getting support from others is not as defined as in the Western culture, represented by the UK sample.

In the UK sample, *using emotional support* coping scale is separate from *using instrumental support* coping scale. Another unique characteristic revealed by the Brief-COPE is that *denial* and *substance use* coping scales were mixed, but these were both defined separately in the UK sample. This may be related to the fact that in Eastern culture and/or predominantly Muslim culture, the use alcohol is suppressed.

The *seeking support* coping scale in the Indonesian sample consisted of the *using emotional support* coping scale, the *using instrumental support* coping scale and one item from the *venting* coping scale. This new component suggesting that in this culture, getting support from others is not as defined as in the Western culture, represented by the UK sample. In the UK sample, the *using emotional support* coping scale was clearly separated from the *using instrumental support* coping scale. Another unique characteristic revealed from the Brief-COPE is that the *denial* and the *substance use* coping scales were mixed, but these were both defined separately in the UK sample. This may be related to the fact that in the Eastern culture and/or predominantly Muslim culture, the use alcohol is repressed.

Similarly to the UK sample, the reliability of the three scales in the Indonesian sample reveals moderate to low consistencies. The *active coping* and *seeking support* coping scales have good levels of consistency, but the *positive outlook* coping scale has the lowest.

The aim of this chapter and previous chapter is to test the psychometric properties in each countries. It has been shown that there are cross-cultural differences reflected in the psychometric properties of the MacNew questionnaire and Brief-COPE. For the purpose of comparison between countries' results, and comparison with previous findings, the original scales of the MacNew questionnaire will be maintained. The original fourteen scales of the Brief-COPE (Carver *et al*., 1989) were based on theoretical perspectives instead of based on their statistical findings. Therefore, for the Brief-COPE, the scales as found in the UK sample will be based on, as it was able to show more similarities to the *a priori* scales.

PART FOUR: THE CROSS-CULTURAL STUDY

The responsiveness of the measurements utilised in this study were explored in Part Three. The results in both countries showed similarities and differences compared with the findings of the questionnaire originators. There are also similarities and differences in responsiveness between the two countries. These differences may reflect cultural differences with previous findings, which are based on Western culture. This may also be true in the UK study, where the sample included British South-Asians. For the purpose of comparison, the original scales of the MacNew questionnaire and B-IPQ were maintained, but the scales of Brief-COPE will utilised the psychometric properties in the UK sample.

As set out in the specific objectives of this study (see section 6.2), Part Four contains the results of the cross-cultural study, which is the centre of this thesis. The cross-cultural study took place in the East and West. The following three chapters report on each of these and compare the findings.

CHAPTER 9 THE UNITED KINGDOM STUDY

9.1 Introduction

Being the main cause of premature death in the country and a considerable financial cost to the nation, it is crucial to study CHD in the UK population. With progress in the treatment of CHD, more and more people survive their first heart attack. Therefore, it is important to further investigate illness beliefs from the survivors' perspective in order to help them achieve a better HRQOL and prevent recurring attack based on the self-regulation processes.

This chapter begins with an explanation of the purpose of the study, the constructs measured, statistical analysis and concludes by setting out the findings.

9.2 Analysis

The objective of the study reported in this chapter is to test the concurrent associations between illness beliefs and coping cognitions with HRQOL in the UK sample in-patient heart attack victims. In addition, these variables are explored to find how they relate to HRQOL. This analysis began with exploratory analyses of socio-economic and clinical variables to determine and the correlations with the relationship between the variables measured. This correlational analyses also served to meet the assumption of conducting regression analyses, where variables should not have a very high correlation of .09 or more (Field, 2009). The UK sample characteristics, location, and recruitment process have been explained in Chapter Six.

Mean (*M*) and standard deviation (*SD*) will be reported, if applicable. Mean is the average value and standard deviation is showing the variation of the mean: a low *SD* score indicates that the data points tend to be close to the mean and data is spread out over a large range of values when *SD* has a high value (Field, 2010).

9.2.1 *Correlational analyses between variables*

The relationships between socio-demographic variables, clinical variables, illness representations, coping cognitions, and HRQOL were explored. Different statistical analysis was being performed depending on the types of different associative variables.

9.2.2 *Relationships between socio-demographic and clinical variables with coping cognitions, illness beliefs, and health-related quality of life*

To explore how socio-demographic and clinical variables are related with coping cognitions, illness beliefs and HRQOL, a correlation analysis was conducted using Pearson product-moment correlation coefficient. The socio-demographic variables included were: gender, age, ethnicity and hospital of admission. The clinical variables were: number of days between infarct and data collection, whether participants realised they were having a heart attack, family history, smoking habit, blood pressure, diabetes, angina and exercise regime. These were tested against illness beliefs, coping cognitions and HRQOL.

The Pearson's product-moment correlation was conducted between age and illness beliefs, and the Spearman rho between age and coping cognitions and dimensions of HRQOL. For the relationship between gender and illness beliefs, the Mann-Whitney U test was used; and the independent *t*-test between gender and coping cognitions and dimensions of HRQOL. Similarly, for age, the Spearman's Rank Order Correlation was performed between age and illness beliefs; and the Pearson

product-moment correlation between age and coping cognitions and HRQOL. For the relationship between ethnicity (British-Whites and British-Indian/Pakistan) and illness beliefs, a Mann-Whitney U test was used; and the independent *t*-test between ethnicity and coping cognitions and dimensions of HRQOL. Hospital of admission was analysed using the non-parametric ANOVA Kruskal-Willis test on illness beliefs; and One-Way ANOVA on coping cognitions and HRQOL. On categorical data, the median (*Mdn*), instead of mean (*M*) will be reported. Effect sizes will also be reported based on small effect (.1), medium effect (.3) and large effect (.5) (Cohen, 1992).

There was no relationship between gender and coping cognitions. Using the Mann-Whitney U test, to test mean difference for non-parametric test, gender was unrelated to any of illness beliefs. However, the independent *t*-test revealed that there was a significant difference between male (M_{Male} = 1.40, *SD* = .66) and females in *substance use* coping (M_{Female} = 1.09, *SD* = .27; *t* (130) = 3.72, *p* = .000), there was a significant difference between males (M_{Male} = 2.08, *SD* = 1.11) and females in *spiritual* coping (M_{Female} = 2.09; *SD* = 1.30, *t* = -.05, *p* = .024). Thus, males were more likely to *use substances* to cope, and less likely to engage in *spiritual* coping compared with women.

There were significant relationships between age and illness beliefs and coping cognitions. A Spearman rho test was conducted to test the correlation between age and illness beliefs and it was found that there were negative relationships between age and perceived illness *consequences* (*r* = -.23, *p* = .008), perceived illness *timeline* (*r* = -.21, *p* = .017) and perceived illness *understanding* (*r* = -.19, *p* = .029). Furthermore, Pearson product-moment correlation revealed a significant correlation between age and *self-distraction* coping (*r* = .18, *p* = .042). No correlations were found between age and HRQOL. Older participants were more likely to perceive the consequences of their heart attack condition to be

worse, perceive it to be longer lasting, understand less about their heart attack and use less self-distraction coping compared with younger ones.

There was a relationship between ethnicities and illness beliefs and coping, but not HRQOL. Using the Mann-Whitney U test, there was a borderline significant result between British-White (Mdn_{Whites} = 68.27) and British-Indian/Pakistani samples in perceiving *treatment control* ($Mdn_{Indian/Pakistanis}$ = 53.72; U = 1123, z = -1.90, p = .058 - borderline), with a small effect (r = .17). The independent t-test revealed that British-Whites (M_{White} = 1.41, SD = .66; t (130) = 5.35, p = .000) were more likely to utilise *substance use* coping compared to the British-Indian/Pakistanis ($M_{Indian/Pakistani}$ = 1.03, SD = .13). Thus, the British-White people were more likely to use substance to cope compared with British-Indian/Pakistani people.

There was a relationship between hospital of admission with illness beliefs, coping cognitions and HRQOL. A Kruskal-Wallis Test revealed a statistically significant difference in hospital of admission in relation to perceived illness *concern* (Hospital 1, n = 36, Hospital 2, n = 7; Hospital 3, n = 30; Hospital 4, n = 13; Hospital 5, n = 42), χ^2 (4, n = 130) = 12.71, p = .013). Those who were admitted to Hospital 2 at the time of interview showed the highest median score (Mdn_{h2} = 8) than Hospital 1 (Mdn_{h1} = 2), Hospital 3 (Mdn_{h3} = 4), Hospital 4 (Mdn_{h4} = 7), and Hospital 5 (Mdn_{h5} = 6). In addition, there was also a borderline significant difference on perceived illness *timeline* (χ^2 (4, n = 130) = 9.20, p = .056). Furthermore, One-Way ANOVA revealed there was a significant difference in hospital of admission on *self-distraction* coping: (F (5, 124) = 3.55, p = .005), with small effect size (r = .12) calculated using eta squared. The same analysis also revealed a significant difference on emotional-related HRQOL (p = .049). Despite reaching statistical significance, the actual difference in means scores between the groups was quite small. Post-hoc analysis using Tukey HSD test indicated that there was a significant mean difference between Hospital 4 (M_{h4} = 2.15, SD = .59)

and Hospital 5 (M_{h5} = 3.00, *SD* = .68). The same analysis also revealed a significant difference on *emotional*-related HRQOL: (F (5, 124) = 2.30, p = .049), with small effect size (r = .08) calculated using eta squared. The actual difference in means scores between the groups was also quite small. Post-hoc analysis using Tukey HSD test indicated that there was a significant mean difference between Hospital 4 (M_{h4} = 4.62, *SD* = .702) and Hospital 5 (M_{h6} = 5.24, *SD* = .701). In relation to illness beliefs, it was found that patients with a heart attack who were admitted to Hospital 2 had more perceived *concern* about their illness compared with those who were admitted to the rest of the hospitals. In using coping cognition, those with heart attack admitted to Hospital 5 were more likely to engage in *self-distraction* coping and to have better *emotional*-related HRQOL compared to those in Hospital 4.

Clinical variables measured were number of days since having a heart attack, whether they realised they were having a heart attack at onset, family history of heart disease, smoking habit, pre-existing high blood pressure, pre-existing diabetes, diagnosed angina and exercise habits. Spearman rho non-parametric test was used to test the relationship between number of days since having a heart attack and illness beliefs and Pearson correlations were used to investigate the relationship between the number of days since onset and coping cognitions and HRQOL. Other predicting variables were measured using the Mann-Whitney U test against illness beliefs, and the independent *t*-test against coping cognitions and HRQOL.

Number of days following onset at the time of the interview were also linked to illness beliefs and coping cognitions. Number of days following onset at the time of the interview was negatively correlated with perceived illness *concern* (r = -.22, p = .012), and at a borderline significance level with perceived illness *timeline* (r = .17, p = .056). Only one coping cognition was associated with number of days following onset; a negative correlation between number of days following onset

and *substance use* coping (r = -.21, p = .019). Thus, people who just experienced a heart attack had more concern and perceived their illness as lasting longer compared to those who are in 'later days'. Also, those in the 'later days' are less likely to consider using substance to cope.

There was no significant relationship between whether one realised they were having a heart attack at the time of onset or not with illness beliefs and coping cognitions. There was a difference between those who realised they were having an MI at the time of onset ($M_{realised}$ = 5.89, SD = .67) and not ($M_{not\text{-}realise}$= 5.64, SD = .97; t (51) = -1.5, p = .031) in *physical*-related HRQOL; and those who realised ($M_{realised}$ = 6.18, SD = .49) or those who did not ($M_{not\text{-}realise}$= 6.03, SD = .49; t (56) = -6.85, p = .015) in *social*-related HRQOL. Those who did not know they were having a heart attack had worse *physical*-related and *social*-related HRQOL.

There was a significant relationship between having a family history of heart disease and not having a family history with HRQOL. A borderline relationship between having a family history ($Mdn_{history}$ = 6) and not having ($Mdn_{no\text{-}history}$ = 3; U = 1416, z = -1.81, p = .071) was observed, with a small effect (r = 0.16) in perceived illness *concern*. However, there was a significant relationship between having a family history ($M_{history}$ = 6.16, SD = .55) and not having a family history ($M_{no\text{-}history}$ = 6.03, SD = .81; t (114) = -1.05, p = .002) in *social*-related HRQOL using the independent t-test. Those without family history of heart disease had a lower *social*-related HRQOL.

Different smoking habits showed a significant difference in some aspects of illness beliefs. Using non-parametric ANOVA, a Kruskal-Wallis test, it was revealed that there was a significant difference between different smoking habits in relation to perceived illness *timeline* (Group1, n = 52: non-smoker, Group2, n = 33: quit smoking less than ten years ago, Group3, n = 17: quit smoking ten years or more, and Group4, n = 28: smoker) (χ^2 (3, n = 130) = 11.34, p = .010). Among those

who quit smoking within less than ten years had a higher median ($Mdn_{<10years}$ = 5), compared to those who had quit smoking for ten years or more ($Mdn_{\geq 10years}$ = 2), smoker (Mdn_{Smoker} = 4) and non-smoker ($Mdn_{Non\text{-}smoker}$ = 3) in relation to perceiving illness *timeline.* Thus, those who quit smoking less than ten years ago perceived their illness to lasts longer compared to current-smoker, non-smoker and those who quit recently.

There was a significant relationship between pre-existing diabetes in relation to illness beliefs and coping cognitions. Using the Mann-Whitney U test, there was a relationship between those with diabetes ($Mdn_{Diabetes}$ = 8) and not having diabetes ($Mdn_{no\text{-}Diabetes}$ = 9; U = 1451, z = -2.1, p = .033), with a small effect (r = .18) in relation to perceived *treatment control*. Using the independent *t*-test, it was found that there was a significant difference in relation to having a pre-existing diabetes ($M_{Diabetes}$ = 1.72, SD = .57) and not having diabetes ($M_{no\text{-}Diabetes}$ = 1.85, SD = .76; t (108) = 1.05, p = .018) in using *avoidance coping*, and between having a pre-existing diabetes ($M_{Diabetes}$ = 2.42, SD = 1.31) and not having ($M_{no\text{-}Diabetes}$ = 1.92, SD = 1.04; t (69) = -2.18, p = .002) in using *spiritual* coping. People with pre-existing diabetes perceived their treatment with less sense of control than those who did not have. Those with diabetes were also less likely to use *avoidance* coping and use more *spiritual* coping.

Those who are having a pre-existing high blood pressure and those who did not, showed a relationship with some illness beliefs and coping cognitions. Using the Mann-Whitney U test, it was found that there was a significant relationship between having a pre-existing high blood pressure (Mdn_{BP} = 2.5) and not having high blood pressure ($Mdn_{no\text{-}BP}$ = 4; U = 1503, z = -2.5, p = .013), with a small effect (r = .25) in perceived illness *perceived control*. Using the independent *t*-test, it was found that there was a difference in having a pre-existing high blood pressure (M_{BP} = 2.94, SD = .70) and not having ($M_{no\text{-}BP}$ = 3.16, SD = .84; t (125) = -1.84, p = .032) in using *self-distraction* coping, and between having a pre-existing

high blood pressure (M_{BP} = 1.26, *SD* = .50) and not having ($M_{no\text{-}BP}$ = 1.38, *SD* = .68; *t* (125) = 1.184, *p* = .043) in using *substance use* coping. There was no difference between those who had a pre-existing high blood pressure and those who did not in HRQOL. People with pre-existing blood pressure have a better perceived personal control of their heart attack, less likely to use self-distraction and less likely to use substances to cope compared with those who did not.

There was also a significant relationship between previously diagnosed angina and non previous-angina group in perceiving their illness and using coping cognitions. Using the Mann-Whitney U test, it was found that those with previous *angina* (Mdn_{Angina} = 8) and not having angina ($Mdn_{no\text{-}Angina}$ = 9; *U* = 174.5, *z* = -2.70, *p* = .007) showed a relationship with perceived *personal control* with a small effect (*r* = .24). There was also a difference in *social*-related HRQOL between those who had a previous angina (M_{Angina} = 6.09, *SD* = .68) and not having a previous angina ($M_{no\text{-}Angina}$ = 5.51, *SD* = 1.18; *t* (128) = 1.28, *p* = .012). Those who had had a previous angina, perceived less symptoms of their illness, had a better *social* dimension of HRQOL compared with those who had never had a diagnosed of angina.

Finally, there was a relationship between those who exercise regularly and those who did not in perceiving their illness and utilising coping cognitions. Using the Mann-Whitney U test, it was found that those who exercised regularly ($Mdn_{Exercise}$ = 6) and not regularly ($Mdn_{not\text{-}Exercise}$ = 0; *U* = 55, *z* = -2.12, *p* = .034) was related with perceived illness *understanding* with a small effect (*r* = .19). Using the independent *t*-test, it was found that there was a difference in those who exercised regularly ($M_{Exercised}$ = 2.92, *SD* = 2.01) and not ($M_{Not\text{-}Exercised}$ = 2.24, *SD* = .79; *t* (2) = -.59, *p* = .005) in using *approach copin*g. Also, between those who exercised regularly ($M_{Exercised}$ = 5.37, *SD* = 1.57) and not ($M_{Not\text{-}Exercised}$ = 6.08, *SD* = .70; *t* (2) =.78, *p* = .011) in *social*-related HRQOL. Those who exercised regularly understood more about their illness and believe more in their treatment. They

were also more likely to use *approach coping* and had lower *social* dimension of HRQOL.

Results indicate that some of the socio-demographic and clinical variables were associated with coping cognitions, illness beliefs and HRQOL. The socio-demographic variables controlled in the subsequent analyses were: age, gender, hospital of admission and type of occupations, and the clinical variables were: angina, smoking habit, family history of heart disease, reported symptoms of heart attack, and number of days following heart attack at the time of interview.

9.2.2.1 Illness beliefs and quality of life

To explore how illness beliefs were concurrently related with HRQOL, a correlation analysis Pearson correlation coefficient was utilised. The dimensions of illness beliefs were tested against the three aspects of HRQOL. It is hypothesised that *consequences*, *timeline*, *identity*, *concern*, and *emotional responses* would show a negative correlation with *emotional*, *physical* and *social* scales in the MacNew questionnaire; and *personal control* and *treatment control* would show a positive correlation.

The Pearson correlation coefficient between illness beliefs and HRQOL were conducted (Table 9.3). The perceived *identity* scale had a significant negative correlation with all aspects of HRQOL: *emotional* (r = -.34, p = .000), *physical* (r = -.27, p = .002) and at borderline level with *social* (r = -*.22,* p = .013 - borderline). Perceived illness *consequences* also had a significant negative correlation with the *emotional* (r = .34, p = .000) and the *physical*-related HRQOL (r = -.32, p = .003). Perceived illness *timeline* correlated positively with the *social* scale of HRQOL (r = -.24, p = .006), but negatively with the *physical* scale of HRQOL (r = - .22, p = .014). Finally, there was a negative correlation between

the perceived *emotional representation* and the *emotional* scale of HRQOL (r = -.24, p = .007).

The significant results of this analysis confirmed that *consequences*, *timeline*, *identity*, *concern*, and *emotional responses* had a negative correlation with *emotional*, *physical* and *social* scales in the MacNew questionnaire; with the exception of longer illness timeline had a positive correlation with *social* scale. The *personal control* and *treatment control* did not show significant correlation with any of the MacNew questionnaire.

Table 9.3

Correlations between scales of illness beliefs and HRQOL

	Emotional	*Physical*	*Social*
Consequences	-.16 (.075)	.00 (.995)	-.24 (.892)
Timeline	-.18 (.043)	**-.22* (.014)**	**-.24* (.006)**
Personal control	-.04 (.632)	.06 (.483)	.16 (.077)
Treatment control	.01 (.931)	.09 (.324)	.00 (.979)
Identity	**-.34** (.000)**	**-.27* (.002)**	**-.22* (.013)**
Concern	**-.21* (.018)**	-.06 (.473)	-.12 (.178)
Understanding	.07 (.413)	.10 (.252)	.16 (.077)
Emotional representations	**-.24* (.007)**	-.06 (.517)	-.15 (.082)

The correlational analysis revealed that some aspects of illness beliefs were related with aspects of HRQOL. Perceived illness *timeline* was negatively correlated with *physical*- and *social*-health related HRQOL. Perceived illness *concern* and *emotional representations* scales were negatively related to *emotional*-related HRQOL. This means, having more concern and being affected emotionally by having a heart attack were related to less emotional-related HRQOL. Perceived illness *identity* was negatively related to all aspects of HRQOL.

9.2.2.2 Coping cognitions and health-related quality of life

Pearson correlation coefficients between different coping scales and HRQOL are shown in Table 9.4. Nearly all aspects of coping cognitions were unrelated to HRQOL. *Humour* coping (r = .28, p = .003) was positively correlated with *emotional*-related HRQOL and *avoidance coping* (r = .23, p = .016) was in the borderline significance level to the *emotional*-related HRQOL. No other scales had any significant correlations to HRQOL.

Table 9.4

Correlations between coping cognitions and quality of life in the UK sample

	Emotional	*Physical*	*Social*
Approach Coping	**-.22* (.013)**	-.04 (.669)	-.09 (.300)
Venting&Instrumental Support	.03 (.738)	.14 (.127)	.08 (.346)
Avoidance Coping	-.03 (.758)	-.01 (.932)	.16 (.077)
Positive Outlook	.02 (.789)	-.02 (.816)	-.08 (.349)
Substance Use	.16 (.075)	.07 (.449)	**.21* (.019)**
Spiritual	-.08 (.383)	-.12 (.194)	-.09.(.330)
Self-Distraction	.10 (.251)	.02 (.864)	-.05 (.597)
Emotional Support	.03 (.729)	.10 (.271)	-.07 (.444)
Humour	**.24**(.006)**	.08 (.394)	.19 (.030)

The correlational analysis revealed that some types of coping cognitions were related with aspects of HRQOL. *Approach coping* negatively related to *emotional*-aspect of HRQOL, *humour* coping was positively related to *emotional*-aspect of HRQOL and *substance use* coping was positively related to social-aspect of HRQOL.

9.2.2.3 Illness beliefs and coping cognitions

There were some relationships between aspects of illness beliefs and coping (Table 9.5). *Approach coping* was negatively correlated with perceived *emotional*

responses (r = -.24, p = .005), and *positive outlook* coping was negatively correlated with perceived illness *consequences* (r = .24, p = .005). There were also some borderline significant results: *approach coping* is positively correlated with perceived illness *consequences* (r = -.21, p = .015) and perceived illness *understanding* (r = .21, p = .017); *using emotional support* coping and perceived illness *consequences* (r = .22, p = .014); and *humour* and perceived illness *concern* (r = -.21, p = .015).

Table 9.5

Correlations between illness beliefs and coping cognitions

	Consequences	Timeline	Personal control	Treatment control	Identity	Concern	Understanding	Emotional response
Approach	**.21*** **(.015)**	.02 (.792)	.06 (.516)	.10 (.264)	.03 (.757)	.19 (.035)	**.21*** **(.017)**	**-.24**** **(.005)**
Venting & Instrumental Support	.03 (.771)	-.04 (.645)	.20 (.022)	.13 (.136)	.01 (.944)	-.04 (.668)	.06 (.477)	-.08 (.391)
Positive Outlook	-.04 (.673)	.10 (.270)	**-.24*** **(.007)**	-.19 (.032)	.03 (.743)	.01 (.905)	-.10 (.244)	.07 (.424)
Avoidance	.05 (.587)	.02 (.837)	.06 (.474)	-.04 (.692)	-.01 (.948)	-.15 (.084)	-.11 (.196)	-.12 (.188)
Substance Use	.09 (.325)	.11 (.232)	.07 (.400)	.13 (.157)	.07 (.464)	.17 (.060)	.12 (.184)	-.16 (.078)
Spiritual	.01 (.921)	.12 (.172)	-.15 (.081)	-.03 (.781)	.06 (.486)	.00 (.961)	-.02 (.819)	-.04 (.655)
Self-Distraction	-.04 (.657)	-.05 (.590)	-.11 (.209)	-.08 (.365)	.06 (.493)	.05 (.587)	-.01 (.819)	.09 (.655)
Using emotional support	.13 (.150)	-.11 (.224)	.07 (.441)	-.01 (.889)	-.09 (.316)	-.31 (.752)	**.22*** **(.014)**	-.14 (.122)
Humour	-.20 (.027)	-.05 (.587)	.03 (.699)	-.16 (.066)	-.14 (.116)	**-.21*** **(.015)**	-.05 (.560)	-.18 (.038)

There were some relationships between illness beliefs and coping cognitions. *Approach coping* was positively related to perceived *consequences* and *understanding*, and negatively related to *emotional response*. Furthermore, *positive outlook* was negatively related to *personal control*, *using emotional*

support coping was positively related to perceived illness *understanding*. Finally, *humour* coping was negatively related to perceived *concern*.

9.2.3 *Regression analyses*

As set out in the specific objectives of this study (see section 6.2), this section analyse the concurrent relationships between illness beliefs and coping cognitions with HRQOL in the Western sample. It is hypothesised that low IPQ scores on perceived *consequences*, perceived *timeline*, perceived *identity*, perceived *concern* and perceived *emotional responses* would be concurrently related with better *emotional*, *physical* and *social* MacNew scales in the UK sample, and that high IPQ scores on perceived *personal control* and perceived *treatment control* will show a significant positive correlation and be concurrently related with better *emotional*, *physical* and *social* MacNew scales. Regarding coping cognitions, it is hypothesised that in this initial stage of CHD, *avoidance* coping in the Brief-COPE scale will be concurrently associated with better scores on the *emotional*, *physical* and *social* MacNew scales.

A series of regression analyses was performed to measure the relationship between aspects of HRQOL, after controlling for socio-demographic and clinical variables. The objective of this analysis was to test the concurrent relationships of different socio-demographic and clinical variables, coping cognitions and illness beliefs against aspects of HRQOL as an outcome measure.

Dummy variables were created for some nominal data in the socio-demographic and clinical variables. There were data coded as labels in gender (male and female), hospital of admission (Hospital 1, Hospital 2, Hospital 3, Hospital 4, Hospital 5 and Hospital 6), and ethnicity (British-White, British-Indian/Pakistani, British-African). Due to the low number of participants from Hospital 6 (n = 2)

and British-African participants (n = 1), these variables were excluded from this analyses.

To control for traditional risk factors and to look at the contribution of health beliefs and coping cognitions upon HRQOL, the hierarchical method will used. Hierarchical regression is a method where the researcher decides in which the order predictors are entered into the regression model based on previous research: known variables are entered first and followed by new variables (Field, 2009). This hierarchical regression analysis was performed to explore variables measured against the aspects of HRQOL: *emotional*, physical and daily activities (*physical*), and *social*. Socio-demographic variables (i.e. age, gender, jobs, ethnicity, hospital of admission) and clinical variables (i.e. family history of heart disease, smoking habit, previous angina, pre-existing conditions of diabetes and high blood pressure, number of days following heart attack at the time interview, whether the participant realised they were having a heart attack and reported symptoms of heart attack) were controlled for in the first block for all aspects of HRQOL. The following blocks are grouped theoretically. Coping cognitions (*approach coping, venting and using instrumental support, avoidance coping, positive outlook, substance use, spiritual, self-distraction, using emotional support*) were included in the second block. Finally, aspects of illness beliefs (*consequences, timeline, personal control, treatment control, identity, concern, understanding, and emotional response*) were included in the final block.

The significance level was set at .05 and borderline significant results up to .09 were also reported. Only the final significant model and significant variables are reported in the analyses below.

9.2.3.1 Concurrent relationships between illness beliefs and coping with *emotional*-related quality of life

The third model was highly significant. In this model, *emotional*-related HRQOL (F (34, 130) = 1.98, p = .005, R^2 = .205) was concurrently related to pre-existing diabetes (p = .045), and perceived illness *identity* (p = .001). Other variables were at borderline significance level: being British-White vs Non-British Whites (p = .097), being British-Indian/Pakistani vs Non-British-Indian/Pakistani (p = .089), and Hospital 4 vs Non-Hospital 4 (p = .064). In total, this model, explains 21% of the variance.

Table 9.5

*Third model of emotional-related quality of life in the UK sam*ple

	% R^2	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Diabetes vs Non-diabetes	.205	1.98	.18	2.03	.045	.006 – .532
Identity			-.36	-3.37	.001	-.142 – -.037
British- Indian/Pakistani vs non British-Indian/Pakistani			.78	1.72	.089	-.199 – 2.794
Hospital4 vs non-Hospital4			-.45	-1.87	.064	-2.135 – .061

As predicted, high score on illness *identity* was concurrently related with worse HRQOL.

This result suggests that having worse perceived symptoms relating to heart attack and having diabetes concurrently associated with worse *emotional*-related HRQOL.

9.2.3.2 Concurrent relationships between cognitive coping and illness beliefs with *physical*-related quality of life

The *physical*-aspect of HRQOL is not concurrently related with any model proposed (F (34, 130) = 1.399, p = .104).

Table 9.5

ANOVA table of physical-related HRQOL in the UK sample

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.178	17	.952	1.148	.320[a]
	Residual	92.871	112	.829		
	Total	109.049	129			
2	Regression	24.076	26	.926	1.122	.331[b]
	Residual	84.973	103	.825		
	Total	109.049	129			
3	Regression	36.383	34	1.070	1.399	.104[c]
	Residual	72.666	95	.765		
	Total	109.049	129			

9.2.3.3 Concurrent relationships between coping cognitions and illness beliefs with *social*-related quality of life

The third model of *social*-related HRQOL was significant. In this model, *social*-related HRQOL (F (34, 130) = 1.90, p = .008, R^2 = .192) were concurrently related with *avoidance coping* (p = .010), and perceived illness *identity* (p = .005). There were other variables that were close to the significance level: age (p = .059), and being British-Indian/Pakistani vs Non-British-Indian/Pakistani (p = .082). In total, this model, explains 19% of the variance.

Table 9.6

Third model of social-related HRQOL in the UK sample

	% R^2	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Avoidance	.192	1.90	.26	2.62	.010	.065 – .474
Identity			-.31	-2.90	.005	-.136 – -.025
British- Indian/Pakistani vs non-British-Indian/Pakistani			.80	1.76	.082	-.181 – 2.947
Age			-.19	-.1.91	.059	-0.20 – .000

As predicted, high score on illness *identity* was concurrently related with worse HRQOL. Using *avoidance* coping in this early stage was concurrently related with better HRQOL.

This result suggests that opting for *avoidance coping*, and having worse perceptions of symptoms *identity* are concurrently associated with *social*-aspect of HRQOL.

9.3 Summary

As stated earlier in this chapter, the aim of the study was to test the concurrent associations between illness beliefs and coping cognitions with HRQOL in the UK sample, as well as to explore the influence of socio-demographic and clinical variables upon illness beliefs, coping cognitions and HRQOL in this sample.

The analyses showed that 19 to 21% of *emotional*- and *social*-related HRQOL can be predicted by using the model in this study. Perceived illness *identity* was found consistently to concurrently associate with HRQOL.

It was hypothesised that ethnicity and hospital of admission were also shown to have a weak predictive value to these outcome measures of HRQOL. This suggests that being of a certain ethnicity and the hospital of admission had an influence on *emotional*-aspects of HRQOL.

As predicted, there was also a difference in ethnicity in *substance use* coping. The British-White sample was more likely to utilise *substance use* coping with stress compared with the British South-Asian sample. This suggests that there is a need to conduct and intervention in this area to emphasise to the British-White population how to drink responsibly. The explanation for ethnicity may lie in cultural factors, such as diet and religion, which could have an effect on how a person experiences emotions and relates to others. One of the implications is that there is less access to alcohol among the British South-Asians compared with their British-White counterparts.

As predicted, high scores on perceived illness *identity*, illness *concern*, and perceived *emotional responses* were concurrently associated with worse HRQOL. Using *avoidance* coping was also concurrently associated with better HRQOL, at this initial stage.

Further discussion of the results presented in this chapter and comparison with the Indonesian results follows in Chapter Eleven. First, the Indonesian study will be reviewed in the following Chapter Ten.

CHAPTER 10 THE INDONESIAN STUDY

10.1 Introduction

There is a contrast between the epidemiology, health care and research dedicated to CHD between the UK and Indonesia. There are also cultural differences that might contribute to how illness is perceived and which coping styles are used when reaching towards the goal of a better HRQOL. As discussed in Chapter Four, the B-IPQ has proved useful in the study of cardiac illness beliefs in many Western countries, but so far there have been no published data on adaptations of this instrument representing Eastern cultures. This makes it important to conduct research in the East and compare it with the findings from the West.

The aim of the following study is to test the concurrent associations between illness beliefs and coping cognitions with HRQOL in the Indonesian sample after heart attack. In addition, these variables are explored to find how they relate to HRQOL. The sample characteristics, location, and recruitment process have been explained earlier (see Chapter Six). This chapter begins with an explanation of the purpose of the study, the constructs measured, statistical analysis and concludes by setting out the findings.

10.2 Results

10.2.1 *Correlational analyses*

Similar to the UK sample, correlational analyses was conducted to explore the relationship between clinical variables, illness beliefs, coping cognitions, and HRQOL.

10.2.2 *Relationships between socio-demographic and clinical variables with coping cognitions, illness beliefs and health-related quality of life*

Similarly to the UK study, a range of relationships between socio-demographic variables and illness beliefs, coping cognitions and HRQOL were assessed. Pearson's product-moment correlation was conducted between age and illness beliefs, and the Spearman rho between age and coping cognitions and dimensions of HRQOL. For the relationship between the rest of the socio-demographic variables: gender, hospital of admission, illness beliefs, the Mann-Whitney U test was used; and the independent *t*-test between gender, coping cognitions and dimensions of HRQOL.

There was a difference between gender in illness beliefs and coping cognitions. Using the Mann-Whitney U test, to test mean difference for non-parametric test, it was found that there was a difference between male (Mdn_{Male} = 3.00) and female in perceived illness *consequences* (Mdn_{Female} = 3.50; U = 702; z = -2.22, p = .026) with a small effect (r = .21), and between male (Mdn_{Male} = 3.00) and female in perceived *personal control* (Mdn_{Female} = 3.50; U = 725; z = -2.04, p = .042) with a small effect (r = .19). The independent *t*-test revealed that there was a significant difference between male (M_{Male} = 1.71, SD = .64) and female in *avoidance* coping (M_{Female} = 1.76, SD = .46; t (43) = -.39, p = .034). There was no difference between male and female in HRQOL. Female perceived the less consequences of their illness and more likely to use *avoidance* coping compared with male.

There was no significant relationship between age, with illness beliefs, coping cognitions and HRQOL. The Spearman rho test found no significant relationship between age and illness beliefs and Person product moment also revealed no significant relationship between age and coping cognitions, as well as between age and HRQOL.

There was a relationship between hospital of admission, with illness beliefs, coping cognitions and HRQOL. Using the Mann-Whitney U test, there was a significant result between those admitted to Hospital A (Mdn_{hospA} = 8.00) and Hospital B was related perceived *personal control* (Mdn_{hospB} = 9.50; U = 213, z = -3.11, p = .002), with a medium effect (r = .30). The independent t-test revealed that there was a significant difference between hospital of admission on *substance use* coping. Those admitted to Hospital A (M_{hospA} = 1.71, SD = .64) and Hospital B (M_{hospB} = 1.76, SD = .46; t (102) = -.39, p = .034) differed in the use of *substance use* coping. Finally, there was also differences in HRQOL; those in Hospital A (M_{hospA} = 4.70, SD = .84) and Hospital B (M_{hospB} = 4.85, SD = .41; t (17) = -.93, p = .005) differed in *emotional*-related. Thus, people admitted to Hospital A perceived less *personal control* of their illness and engaged less *substance use* coping and those in Hospital A also have lower *emotional* dimension of HRQOL compared with those who stayed in Hospital B.

Clinical variables were number of days since having a heart attack, whether they realised they were having a heart attack at onset, family history of heart disease, smoking habit, pre-existing high blood pressure, pre-existing diabetes, diagnosed angina and exercise habits. Spearman rho non-parametric test was used to test the relationship between number of days since having a heart attack and illness beliefs and Pearson correlations were used to investigate relationship between the number of days since onset and coping cognitions and HRQOL. Other predicting variables were measured using the Mann-Whitney U test against illness beliefs, and the independent t-test against coping cognitions and HRQOL.

The number of days following onset at the time of the interview was not related with illness beliefs, coping cognitions and HRQOL. No significant result was found among these variables.

There was no relationship between whether one realised they were having a heart attack at the time of onset or did not, with illness beliefs and coping cognitions, but there was an association with HRQOL. Using the independent *t*-test, there was no difference found in coping cognitions, but there was a difference among those who realised they were having an MI at the time of onset ($M_{realised}$ = 5.89, *SD* = .67) and those who did not ($M_{not\text{-}realised}$ = 5.64, *SD* = .97; *t* (51) = -1.5, *p* = .031) in *physical*-aspect of HRQOL; and realised ($M_{realised}$ = 6.18, *SD* = .49) or not realised ($M_{not\text{-}realised}$ = 6.03, *SD* = .49; *t* (56) = - 6.85, *p* = .015) in *social*-aspect of HRQOL. Those who did not know they were having a heart attack have worse *physical*-related and *social*-related HRQOL compared with those who knew they were having a heart attack.

There was a significant relationship between having a family history of heart disease with illness beliefs, coping cognitions and HRQOL. Using the Mann-Whitney U test, it was found that there was a difference between those with a family history ($Mdn_{history}$ = 9) and without in perceived *treatment control* ($Mdn_{no\text{-}history}$ = 8; *U* = 1017; *z* = -2.06, *p* = .039). As tested using the independent *t*-test, it was found that there was a significant relationship between having a family history ($M_{history}$ = 6.16, SD = .55) and not ($M_{no\text{-}history}$ = 6.03, *SD* = .81; *t* (114) = -1.05, *p* = .002) in using *humour* coping. Among aspects of HRQOL, there was a significant relationship between having a family history ($M_{history}$ = 4.81, SD = .65) and not ($M_{no\text{-}history}$ = 4.68, *SD* = .87; *t* (83) = -.85, *p* = .043) in *emotional*-related HRQOL. Those with a family history of heart disease perceived more treatment control, use more humour coping, and have a better *emotional*-related HRQOL compared with those without a family history of heart disease.

There were differences among current smokers, those who quit smoking recently, those who quit smoking more than ten years ago, and non-smokers in perceived illness beliefs. Using the non-parametric ANOVA, a Kruskal-Wallis Test revealed a statistically significant differences between different smoking habits in perceived

treatment control (Group1, n = 38: non-smoker, Group2, n = 11: quit smoking less than ten years ago, Group3, n = 11: quit smoking ten years or more, and Group4, n = 53: current smoker), (χ^2 (3, n = 130) = 13.27, p = .004). Those who quit smoking within less than ten years ($Mdn_{<10years}$ = 7) believed less in their treatment, compared with those who had quit smoking for ten years or more ($Mdn_{\geq 10years}$ = 10), current smokers (Mdn_{Smoker} = 9) and non-smokers ($Mdn_{Non\text{-}smoker}$ = 9), and in perceived illness *understanding* (χ^2 (3, n = 130) = 7.83, p = .050). Those who were current smokers (Mdn_{Smoker} = 4) believed that they understood more about heart attack than those who had quit smoking for ten years or more ($Mdn_{\geq 10years}$ = 1), smoker ($Mdn_{<10years}$ = 2) and non-smokers ($Mdn_{Non\text{-}smoker}$ = 3). There were differences between smoking habits in using *spiritual* coping (F (3, 109) = 5.25, p = .002). Among those who were using *spiritual* coping, there was a significant mean difference between non-smokers ($Mdn_{Non\text{-}smoker}$ = 3.62) and those who quit less than 10 years ($Mdn_{<10years}$ = 2.77), and between non-smokers and smokers (M_{Smoker} = 3.02). Thus, those who quit smoking more than ten years ago believed more in their treatment, and those who were current smokers believed they understood more about their heart attack compared with the other groups. In utilising coping cognitions, *spiritual* coping use was the most common among non-smokers.

There was a relationship between pre-existing high blood pressure and illness beliefs, as well as between pre-existing high blood pressure and coping cognitions. Using the Mann-Whitney U test, it was found that there was a relationship between those with high blood pressure (Mdn_{BP} = 4) and not having ($Mdn_{no\text{-}BP}$ = 4; U = 1503, z = -2.5, p = 0.13), with a small effect (r = .22) in perceived *personal control*. Using the independent t-test, it was found that there was a difference in having a pre-existing high blood pressure (M_{BP} = 1.26, SD = .50) and not having ($M_{no\text{-}BP}$ = 1.38, SD = .68; t (126) = -1.18, p = .043) in *substance use* coping, and between having this pre-existing condition (M_{BP} = 2.94, SD = .84) and not ($M_{no\text{-}BP}$

= 2.69, *SD* = .70; *t* (126) = -1.84, *p* = .032) in *self-distraction* coping. People with pre-existing high blood pressure perceived their illness to be less within their control, and were less likely cope with *substance use* coping and *self-distraction* coping.

Pre-existing diabetes in this sample was not related to any of the variables measured. Using the Mann-Whitney U test, it was found that there was no significant relationship between pre-existing diabetes and illness beliefs. Also, using the independent *t*-test, it was found that there was no significant difference in coping cognitions and HRQOL between those having pre-existing diabetes and those without.

Using the Mann-Whitney U test, it was found that there was a relationship between previous diagnosed angina and perceived illness *understanding*. There was a difference between those with previous *angina* (Mdn_{Angina} = 7) and not having ($Mdn_{no\text{-}Angina}$ = 6; *U* = 219, *z* = -2.28, *p* = .023), with a small effect (*r* = .21) in perceived illness *understanding*. Furthermore, using the independent *t*-test, it was found that there was a difference in having a *angina* (M_{Angina} = 1.00, *SD* = .00) and not having ($M_{no\text{-}Angina}$ = 1.14, *SD* = .40; *t* (104) = 3.69, *p* = .029) in using *substance use copin*g, and between having this pre-existing condition (M_{Angina} = 2.55, *SD* = .80) and not ($M_{no\text{-}Angina}$ = 2.78, *SD* = .72; *t* (10) = -.95, *p* = .061 - borderline) in *using emotional support* coping. Those with a diagnosed angina in the past used less substance and used less emotional support coping compared with those without this pre-existing condition.

Finally, using the Mann-Whitney U test, it was found that there was no association between exercise habits and some illness beliefs. Using the independent *t*-test, it was found that there was a difference between those who exercise regularly ($M_{Exercise}$ = 1.72, *SD* = .57) and not ($M_{not\text{-}Exercise}$ = 1.85, *SD* = .76; *t* (93) = 1.36, *p* =

.024) in using *substance use* coping. Those who exercised regularly, used substances to cope compared with those who did not.

Results indicate that some of the socio-demographic and clinical variables were related to coping cognitions and illness beliefs, as well as with the outcome measure, HRQOL. The socio-demographic variables controlled in the subsequent analyses were: age, gender, hospital of admission and type of occupations, and the clinical variables were: angina, smoking habit, family history of heart disease, reported symptoms of heart attack, and number of days following heart attack at the time of interview.

10.2.2.1 Illness beliefs and quality of life

This section set out to explore how illness beliefs were concurrently related with HRQOL, a correlation analysis Pearson correlation coefficient was utilised. The dimensions of illness beliefs were tested against the three aspects of HRQOL. Similar to the analysis in the previous chapter, it is hypothesised that *consequences*, *timeline*, *identity*, *concern*, and *emotional responses* would show a negative correlation with *emotional*, *physical* and *social* scales in the MacNew questionnaire; and *personal control* and *treatment control* would show a positive correlation.

Pearson correlation coefficients between illness beliefs and aspects of HRQOL were explored (Table 10.3). Perceived illness *identity* had highly significant negative correlations with *emotional*-related HRQOL (r = -.29, p = .004) and *social*-related HRQOL (r = -.28, p = .005). The table also shows that perceived illness *consequences* also had highly significant negative correlations with the *emotional*-related HRQOL (r = -.23, p = .024) and *physical*-related HRQOL (r = -.32, p = .003). Perceived illness *timeline* correlates positively with *emotional*-related HRQOL (r = .32, p = .001), and negatively to *physical*-related HRQOL (r

= -.22, p = .038). Finally, there was a strong positive correlation between the *emotional representations* and the *emotional*-related HRQOL (r = -.23, p = .024).

The significant results of this analysis confirmed that *consequences*, *identity*, *concern*, and *emotional responses* had a negative correlation with *emotional*, *physical* and *social* scales in the MacNew questionnaire. In this sample, as well as in the UK sample, the significant correlations between *personal control* and *treatment control* with any of the MacNew questionnaire was not established.

Table 10.3

Correlations between scales of B-IPQ and MacNew questionnaire

	Emotional	*Physical*	*Social*
Consequences	-.16 (.082)	-.13 (.177)	**-.25* (.008)**
Timeline	.01 (.892)	-.12 (.190)	-.08 (.428)
Personal control	-.01 (.923)	.05 (.586)	.10 (.293)
Treatment control	-.02 (.823)	-.11 (.270)	-.07 (.465)
Identity	**-.34** (.000)**	**-.36** (.000)**	-.16 (.101)
Concern	**-.33** (.000)**	-.14 (.148)	-.14 (.152)
Understanding	-.14 (.129)	-.11 (.247)	-.11 (.240)
Emotional representations	**-.55** (.000)**	**-.21* (.029)**	**-.21* (.026)**

Four out of eight dimensions of illness beliefs were related to HRQOL. Similarly to the UK sample, perceived illness *identity* was related to *emotional*- and *physical* -aspects of HRQOL, perceived illness *concern* was related to *emotional*-related HRQOL and perceived *emotional representations* were related to all aspects of HRQOL.

10.2.2.2 Coping and quality of life

Pearson correlation coefficients between different coping scales and HRQOL are shown in Table 10.4 below. Nearly all aspects of coping were unrelated to

HRQOL. However, *humour* coping (r = .28, p = .003) demonstrated a positive statistically significant relationship with *emotional*-related HRQOL and *avoidance coping* (r = .23, p = .016) achieved a level of borderline significance. Both were positively correlated with *emotional*-related HRQOL.

Table 10.4

Correlations between scales of Brief-COPE and MacNew questionnaire

	Emotional	*Physical*	*Social*
Approach Coping	-.16 (.095)	-.12 (.201)	-.12 (.199)
Venting & Instrumental Support	.14 (.150)	.08 (.414)	.07 (.480)
Avoidance Coping	**.23* (.016)**	.02 (.862)	.14 (.145)
Positive Outlook	.00 (.993)	-.03 (.737)	.01 (.917)
Substance Use	-.12 (.216)	.01 (.917)	-.09 (.370)
Spiritual	.06 (.540)	-.00 (.974)	-.04 (.662)
Self-Distraction	.11 (.232)	.11 (.238)	.15 (.105)
Emotional Support	.12 (.222)	-.06 (.530)	.03 (.719)
Humour	**.28**(.003)**	.02 (.804)	.02 (.862)

There was only one coping cognition correlated with HRQOL. Higher usage of humour coping was correlated with better *emotional*-aspect of HRQOL.

10.2.2.3 Illness beliefs and coping

There were some relationships between illness beliefs and coping cognitions. *Venting and using instrumental support* was positively correlated with perceived *emotional response* to having a heart attack (r = .20, p = .037), *spiritual* coping was positively correlated with perceived illness *identity* (r = .24, p = .012), *self-distraction* was negatively related with perceived illness *timeline* (r = -.18, p = .051) and *avoidance* coping was negatively correlated with *understanding* (r = -.29, p = .002). Also, some relationships achieved a borderline significance level.

The *approach coping* scale was related with perceived illness *identity* (r = .16, p = .082 - borderline), *concern* (r = .18, p = .058 - borderline) and *emotional response* (r = .24, p = .012 - borderline) to having a heart attack (r = .18, p = .055 - borderline).

Table 10.5

Correlations between scales of B-IPQ and Brief-COPE

	Consequences	Timeline	Personal control	Treatment control	Identity	Concern	Understanding	Emotional response
Approach	.14 (.143)	-.08 (.428)	-.00 (.963)	-.07 (.492)	.16 (.082)	**.18 (.058)**	.10 (.307)	**.18 (.055)**
Venting&Instrumental support	-.03 (.775)	-.05 (.583)	-.03 (.790)	.01 (.936)	.10 (.304)	.01 (.919)	.01 (.950)	**.20* (.037)**
Positive outlook	-.08 (.388)	-.02 (.869)	.03 (.766)	.12 (.207)	.01 (.883)	-.07 (.450)	.16 (.085)	-.00 (.964)
Avoidance	.06 (.499)	.03 (.790)	.02 (.806)	-.10 (.208)	.05 (.594)	.02 (.869)	**-.29* (.002)**	-.01 (.935)
Substance use	.03 (.793)	.09 (.350)	-.01 (.922)	.09 (.325)	-.03 (.764)	.17 (.071)	-.01 (.883)	.16 (.090)
Spiritual	.00 (.999)	-.05 (.573)	.00 (.975)	-.07 (.473)	**.24* (.012)**	.16 (.101)	.01 (.906)	-.08 (.401)
Self-distraction	.02 (.869)	**-.18* (.051)**	-.08 (.430)	-.01 (.898)	-.01 (.910)	-.12 (.206)	.01 (.956)	.13 (.170)
Emotional support	.02 (.872)	-.01 (.947)	.01 (.903)	.06 (.500)	.01 (.900)	-.01 (.960)	.13 (.170)	-.15 (.124)
Humour	-.11 (.252)	.02 (.829)	-.00 (.981)	-.03 (.763)	-.01 (.914)	-.09 (.369)	.12 (.222)	-.01 (.882)

A few dimensions of illness beliefs were associated with coping cognitions. Higher use of *venting and using instrumental support* was correlated with having higher illness *emotional response*, higher use of *spiritual* coping was correlated with having higher perceived illness *identity*, higher use of *self-distraction* was correlated with having perceived longer illness *timeline*, and higher use of *avoidance* coping was correlated with less illness *understanding*.

10.2.3 *Regression analyses*

As set out in the specific objectives of this study (see section 6.2), this section analyses the concurrent relationship of illness beliefs and coping cognitions with HRQOL in the Eastern sample. It is hypothesised that low IPQ scores on perceived *consequences*, perceived *timeline*, perceived *identity*, perceived *concern* and perceived *emotional responses* in this Eastern sample would be concurrently related with better *emotional*, *physical* and *social* MacNew scales in each country as well as both countries combined. Further, it is predicted that high IPQ scores on perceived *personal control* and perceived *treatment control* will show a significant positive correlation and be concurrently related with better *emotional*, *physical* and *social* MacNew in this sample. Regarding coping cognitions, *avoidance* coping in the Brief-COPE scale will be concurrently associated with better scores on the *emotional*, *physical* and *social* MacNew scales.

Before starting the analyses, there were procedures conducted regarding the data. Dummy coding was created for categorical variables, that is, gender and hospital of admission (Hospital A, Hospital B). Socio-demographic data (age, gender, jobs, ethnicity, hospital of admission) and clinical variables (family history of heart disease, smoking habit, previous angina, pre-existing diabetes, pre-existing high blood pressure, number of days following heart attack at the time interview, whether participants realised they were having a heart attack and reported symptoms of heart attack) were controlled for in the first block for all HRQOL scales.

The significance level was set at .05 and borderline significant results up to .09 were also considered worth reporting. Only the final significant model and significant variables were reported in the analyses below.

10.2.3.1 Concurrent relationships between coping cognitions, illness beliefs with *emotional*-related quality of life

The third model was highly significant. In this model, *humour* coping (p = .023), perceived illness *identity* (p = .008), perceived illness *understanding* (p = .034) and perceived *emotional response* to having a heart attack (p = .000) and a pre-existing high blood pressure condition (p = .087 - borderline) were concurrently related with *emotional*-related HRQOL (F (28, 113) = 3.57, p = .000, R^2_{Adj} = .406). In total, this model, explains 41% of the variance in the score for *emotional*-related HRQOL.

Table 10.6

Third model of emotional-related quality of life in the Indonesian sample

	$\%R^2_{Adj}$	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Humour	.406	3.57	.25	2.32	.023	.031 – .395
Identity			-.23	-2.73	.008	-.093 – -.015
Understanding			-.20	-2.15	.034	-.093 – .004
Emotional response			-.48	-5.52	.000	-.130 – -.061
High blood pressure			-.14	-1.73	.087	-.491 – .034

As predicted, low scores on illness *identity*, illness *understanding* and *emotional response* to heart attack were concurrently associated with better HRQOL.

These results suggest that having worse perceived illness symptoms *identity*, less *understanding* about heart attack and having less *emotional response* to having a heart attack and using more *humour* in coping predicted better *emotional*-related HRQOL.

10.2.3.2 Concurrent relationships between coping cognitions and illness beliefs with *physical*-related quality of life

This outcome measure is at borderline significance level concurrently related with the model in this study (F (28, 113) = 1.597, p = 0.53, R^2_{Adj} = .131). Concurrent relationships variables included age (p = .008), perceived illness *identity* (p = .002) and perceived *emotional response* to an illness (p = .074 - borderline). In total this model explains 13% of the variance.

Table 10.7

Third model of physical-related quality of life in the Indonesian sample

	$\%R^2_{Adj}$	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Age	.131	1.597	-.28	-2.71	.008	-.059 – -.009
Identity			-.32	-3.19	.002	-.165 – -.038
Emotional response			-.20	-1.81	.074	-.108 – .005

As predicted, high scores on illness *identity* and *emotional response* to heart attack were concurrently associated with worse HRQOL.

These results suggest that older people, having perceived worse symptoms, and having perceived better *emotional response* after having a heart attack contributed to worse *physical*-related HRQOL.

10.2.3.3 Concurrent relationships between coping cognitive and illness beliefs with *social*-related quality of life

The model was concurrently associated with *social*-related HRQOL. It attained statistical significance (F (28, 113) = 1.635, p = 0.45, R^2_{Adj} = .138). The significant associated variables included *positive outlook* coping (p = .020),

avoidance coping (p = .033), *self-distraction* coping (p = .012), perceived *personal control* (p = .020), perceived *treatment control* (p = .033), perceived illness *understanding* (p = .022) and perceived *emotional response* to having a heart attack (p = .047). In total this model explains 14% of the variance.

Table 10.8

Third model of social-related quality of life in the Indonesian sample

	% R^2_{Adj}	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Positive outlook	.138	1.635	.34	2.38	.020	.059 – .667
Avoidance			-.25	-2.17	.033	-.539 – -.024
Self-distraction			.27	2.56	.012	.049 – .390
Personal control			.25	2.38	.020	.011 – .122
Treatment control			-.24	-2.16	.033	-.128 – -.005
Understanding			-.27	-2.34	.022	-.099 – -.008
Emotional response			-.22	-2.02	.047	-.072 – .000

As predicted, low scores on illness *understanding* and *emotional response* to heart attack were concurrently associated with better HRQOL and high scores on *personal control* was concurrently associated with better HRQOL. However, high scores on *treatment control* were concurrently associated with worse HRQOL.

This result suggested that using more *positive outlook* coping, less *avoidance coping*, more *self-distraction* coping, having higher perceived *personal control*, less perceived *treatment control*, less perceived illness *understanding*, and less perceived *emotional response* to having a heart attack are concurrently associated with better *social*-related HRQOL by nearly 14%.

10.3 Summary

As regards the findings, in the Indonesian sample, *humour* coping and perceived cardiac illness *identity* predicted a high proportion of the *emotional*-aspect of HRQOL. This model predicted a higher proportion of this aspect of HRQOL compared with the UK sample. However, the same model could not be concurrently associated with *physical*-related HRQOL.

Perceived illness *identity* regarding heart attack has performed in all significant models in both the Eastern and Western samples. Therefore, modifying the illness *identity* of heart attack victims may play a crucial role in CR programmes.

As predicted, high scores on perceived illness *identity*, and perceived *emotional responses* were concurrently associated with worse HRQOL. However, high scores on perceived illness *understanding* and *treatment control* were not concurrently associated with better HRQOL. In this sample, using *avoidance* coping was not concurrently associated with better HRQOL, at this initial stage.

The following chapter compares the findings from both countries, and discusses the differences.

CHAPTER 11 CROSS-STUDY COMPARISON

11.1 Introduction

As reported in Chapters Nine and Ten, some differences between countries and similarities have been discovered. The findings from both countries will be summarised in this chapter.

The aim of this cross-cultural study is to conduct a comparison between the UK and the Indonesian sample. The following study was designed to examine concurrent associations of illness beliefs and coping cognitions with aspects of HRQOL among both countries sample following a heart attack. This chapter begins with an explanation of characteristics, results and finally a general discussion for Part Three.

11.2 Sample characteristics

As set out in section 6.2, it is hypothesised states that there will be a difference in socio-demographic variables and clinical variables between the UK and the Indonesian sample. This section presents a description of both of the samples, comparing and contrasting their characteristics.

Table 11.1

Gender and age characteristics of the UK and Indonesian samples

Socio-demographic characteristics			
The UK sample: (*N* = 130)		Indonesian sample: (*N* = 113)	
Gender		Gender	
- Male	98 (75%)	- Male	91 (80%)
- Female	32 (25%)	- Female	22 (20%)
Age		Age	
Mean age	68 years	Mean age	54 years
- Minimum	24 years	- Minimum	33 years
- Maximum	92 years	- Maximum	79 years
Age group 20-59	43 (33%)	Age group 20-59	85 (75%)
Age group 60-99	87 (67%)	Age group 60-99	28 (25%)

The above table shows a gender balance in both countries. Consistent with epidemiological literature (see section 2.8.1.3), heart attack is more common among males in most age groups. Seventy-five percent of the UK sample was male, and an even higher percentage of eighty percent in the Indonesian sample. Thus, there is a similar pattern of gender distribution in both samples.

However, the Indonesian sample tended to be younger with an average age of 54, compared with the UK mean of 68, the average difference is about seven years. However, the Indonesian sample has less variance with a sample range of 33 to 79 years of age, compared with a wider range of 24 to 92 in the UK sample. When the age is divided into two major groups of 20 to 59 years of age and 60 to 99 years of age, more than two-thirds of the UK sample fall in the latter group, compared with only a quarter in the Indonesian sample. There is a difference between the samples in age characteristics.

As shown in Table 11.2, Indonesian sample has a higher a proportion of people with family history, diabetes, high blood pressure and smoking than the UK sample. History of angina is similar in both samples.

Table 11.2

Clinical variables of the UK and Indonesian samples

Clinical characteristics - INDONESIA		*Clinical characteristics – THE UK*	
Recent heart attack onset within		Recent heart attack onset within	
- Less than one week	66 (58%)	- Less than one week	103 (79%)
- One week to two weeks	57 (42%)	- One week to two weeks	27 (21%)
Family history		Family history	
- Yes	34 (30%)	- Yes	54 (42%)
- No	79 (70%)	- No	68 (53%)
High blood pressure		High blood pressure	
- Yes	57 (50%)	- Yes	72 (55%)
- No	56 (50%)	- No	56 (43%)
Diabetes		Diabetes	
- Yes	80 (71%)	- Yes	87 (67%)
- No	33 (30%)	- No	43 (54%)
Previous angina pectoris		Previous angina pectoris	
- Yes	8 (7%)	- Yes	7 (5%)
- No	105 (93%)	- No	123 (81%)
		-	
Smoking habits		Smoking habits	
- Non-smoker	23 (20%)	- Non-smoker	52 (40%)
- Quit less than 15 years	11 (10%)	- Quit less than 15 years	33 (25%)
- Quit 15 years or more	11 (10%)	- Quit 15 years or more	17 (13%)
- Smoker	53 (47%)	- Smoker	28 (22%)

11.3 Results

11.3.1 *Comparisons of first and non-first heart attack*

It was hypothesised that there will be differences in clinical variables. Clinical variables of both samples also show differences. In section 6.4, it was explained that there was a difference in sampling technique between the two countries. In the Indonesian sample, all participants were first time heart attack victims, whereas the UK sample included participants with a history of previous heart attack. To test the equality of samples of the first- and non-first time heart attack, tests of mean difference were performed.

Socio-demographic and clinical factors, and the items or scales of responses from the questionnaires were analysed against the first heart attack group compared

with non-first. A non-parametric test, the Chi-square, was used in instances of categorical data (gender, ethnicity); and for continuous data (age, illness beliefs, coping cognitions and HRQOL), the independent *t*-test was used.

Socio-demographic characteristics between the first and non-first time heart attack were analysed. Non-parametric tests were performed for each gender and hospital of admission. About two-thirds of first heart attack cases (75%) and non-first heart attack cases (76%) were male. First heart attacks were equally common in males (85%) and females (84%). However, the Chi-square test demonstrated a non-significant association between gender and the first and non-first timer ($\chi 2$ (1, $N = 130$) = .002, $p = .965$).

Another Chi-square test was conducted for hospital of admission in the first and non-first timers. First timers were predominant in all six UK hospitals. Of the first timer group, the highest was in 32.7% in Hospital 5, followed by 23.6% in both Hospital 1 and Hospital 3, 11.8% in Hospital 4, 6.4% in Hospital 2 and 1.8% in Hospital 5. In the non-first timers, the highest level of 45% was in Hospital 1, followed by 30% in Hospital 5, 20% in Hospital 3, and 5% in Hospital 4. Not surprisingly, there were no participants with non-first time heart attack in the two small samples drawn from Hospital 2 and Hospital 6. However, there was a borderline association between the hospital of admission and the number of infarcts ($\chi 2$ (5, $N = 130$) = 5.37, $p = .079$).

To analyse whether there was any age difference in the first and non-first timers in the UK sample, a parametric test was conducted. Using the independent *t*-test, it was found that there was no age difference between people with a first heart attack (M_{First} = 66.41, SD = 14.02) and non-first timers ($M_{Non\text{-}First}$= 70.85, SD = 11.92; t (128) = -1.33, p = .195 (two-tailed)).

The ethnic origin was measured against first timers and non-first timers in this UK sample using a non-parametric test. The Chi-square test revealed the association

between ethnic origin: British-Whites, British-African and combined British-Indian/Pakistani, and the number of infarcts, but was not significant ($\chi 2$ (1, N = 130) = 1.45, p = .15).

Finally, social class classification based on reported occupations was also tested against first and non-first timers using a non-parametric test. Among those with first heart attack, the majority was in the retirement age range (89%) and similarly, among non-first attack, 80% were of retirement age. Among those who had their first attack, sixteen participants were working in managerial and technical occupations (67%), non-manual skilled (50%), manual skilled (75%) and unskilled (13%). One participant was unemployed. The Chi-square analysis revealed that there were no significant associations between first and non-first timers according to different social class ($\chi 2$ (4, N = 130) = 4.38, p = .36).

Thus, no difference was found between first and non-first timers in the UK sample in respect of socio-demographic characteristics; gender, age, ethnicity, social class, or hospital of admission.

Non-parametric tests were also conducted for all clinical variables to analyse the difference between the first and non-first timers in the UK sample. Chi-square tests revealed there was no significant association between first and non-first heart attack groups with smoking ($\chi 2$ (3, N = 130) = 2.52, p = .47), family history of CHD ($\chi 2$ (5, N = 130) = 1.37, p = .93) and exercise habits ($\chi 2$ (2, N = 130) = .56, p = .46), nor with pre-existing high blood pressure ($\chi 2$ (2, N = 130) = .51, p = .78) or angina ($\chi 2$ (1, N = 130) = .99, p = .32). However, there was a mean difference between having one, or more than one heart attack in respect of diabetes ($\chi 2$ (1, n = 130) = 5.69, p = .017), with 37% of people with diabetes having a first heart attack and 10% having more than one heart attack.

Furthermore, parametric tests were performed for illness beliefs using the independent t-test. There was no significant mean differences in perceived illness

consequences for first timers (M_{First} = 4.09, *SD* = 3.37) and non-first timers ($M_{Non-First}$ = 3.75, *SD* = 3.52, *t* (124) = .42, *p* = .68 (two-tailed)); in perceived illness *timeline* for first timers (M_{First} = 3.49, *SD* = 2.78) and non-first timers ($M_{Non-First}$ = 3.00, *SD* = 2.76, *t* (104) = .67, *p* = .50 (two-tailed)); in perceived *personal control* for first timers (M_{First} = 4.28, *SD* = 3.76) and non-first timers ($M_{Non-First}$ = 3.88, *SD* = 3.28, *t* (113) = .41, *p* = .07 (two-tailed)); *treatment control* for first timers (M_{First} = 8.06, *SD* = 2.40) and non-first timers ($M_{Non-First}$ = 7.75, *SD* = 2.40, *t* (125) = .87, *p* = .86 (two-tailed)); in perceived illness *identity* for first timers, (M_{First} = 3.05, *SD* = 2.80) and non-first timers ($M_{Non-First}$ = 2.70, *SD* = 2.76, *t* (128) = .52, *p* = .83 (two-tailed)); perceived illness *concern* for first timers (M_{First} = 4.41, *SD* = 3.33) and non-first timers ($M_{Non-First}$ = 3.10, *SD* = 3.67, *t* (128) = 1.60, *p* = .50 (two-tailed)); and perceived *emotional response* to illness for first timers, (M_{First} = 2.63, *SD* = 3.27) and non-first timers ($M_{Non-First}$ = 2.60, *SD* = 3.44, *t* (128) = .03, *p* = .71 (two-tailed)). Thus, there was no significant difference in illness beliefs for people with first heart attack compared with those with previous heart attack(s).

Parametric tests were also performed for coping cognitions as measured by Brief-COPE. Using the *t*-test for independent samples, there were no significant mean differences in all type of coping cognitions. The item with a significant difference was *substance use* for first timers (M_{First} = 1.35, *SD* = .64) and non-first timers ($M_{Non-First}$ = 1.18, *SD* = .34, *t* (49) = 1.81, *p* = .015 (two-tailed)).

Finally, the difference between HRQOL, measured by the three scales in the MacNew questionnaire, in first-timers and non-first timers were also assessed with the independent *t*-test. There were no significant mean differences between *emotional*-related HRQOL for first timers (M_{First} = 5.49, *SD* = .76) and non-first timers ($M_{Non-First}$ = 5.39, *SD* = .77, *t* (126) = .64, *p* = .71 (two-tailed)), *physical*-aspect HRQOL for first timers (M_{First} = 5.81, *SD* = .89) and non-first timers ($M_{Non-First}$ = 5.59, *SD* = .71, *t* (126) = .95, *p* = .90 (two-tailed)) and *social*-related quality

of life between first-timers (M_{First} = 6.10, SD = .72) and non-first timers ($M_{Non\text{-}First}$ = 5.92, SD = .79, t (125) = .62, p = .62 (two-tailed)).

Therefore, it can be concluded that first timers and non-first timers were similar in most of the variables measured. There was no difference in socio-demographic characteristics, illness beliefs or HRQOL. However, there was significant difference between those with diabetes and those without, the former being more likely to be first timers. People experiencing subsequent incidents were less likely to report *using substance* than those who had just experienced their first heart attack. This suggests that some people may have modified their lifestyle in accordance with the health advice given after the first incident. A borderline result in differences between these groups was also found in hospital of admission: people who were admitted to Hospital 5 were more likely to be first-timers and those in Hospital 1 are likely to be non-first timers.

Overall, having a first and subsequent heart attacks, showed equality on variables of socio-demographic, clinical, coping cognitions, illness beliefs and dimensions of HRQOL. This suggests that those with a first-time heart attack have an equal chance of having subsequent incidents. Another reason for similarity in coping cognitions, beliefs about heart attack and HRQOL may lie in the recency effect, indicating that having a heart attack, regardless of previous experiences, results in a similar emotional and cognitive pattern.

11.3.2 *Regressions analyses*

As set out in the specific objectives of this study (see section 6.2), this section analyse the concurrent relationships of illness beliefs and coping cognitions in the Eastern and Western samples. It is hypothesised that low IPQ scores on perceived *consequences*, perceived *timeline*, perceived *identity*, perceived *concern* and perceived *emotional responses* would be concurrently related with better

emotional, *physical* and *social* MacNew scales combined samples, and that high IPQ scores on perceived *personal control* and perceived *treatment control* will show a significant positive correlation and be concurrently related with better *emotional*, *physical* and *social* MacNew scales in this combined sample. Regarding coping cognitions, it is hypothesised that the UK sample will show a higher score on *spiritual* and *substance use* coping scale in the Brief-COPE compared with the Indonesian sample and in this initial stage of CHD, *avoidance* coping in the Brief-COPE scale will be concurrently associated with better scores on the *emotional*, *physical* and *social* MacNew scales.

A series of regression analyses were performed for all aspects of HRQOL on the combined sample. Variables were collated and the Indonesian sample is identified by ethnicity. Dummy variables were coded on categorical data. Similarly to the analysis in Chapter Nine, the low number of British-African and patients recruited from Hospital 6 resulted in these variables being excluded from the subsequent analysis.

11.3.2.1 Concurrent relationships between coping cognitions and illness beliefs with *emotional*-related quality of life

All three models proposed were highly significant. In the third model, worse *emotional*-related HRQOL (F (33, 243) = 4.79, p = .000, R^2_{Adj} = .342) was concurrently related with admission to Hospital 4 vs Non-Hospital 4 (p = .033), *humour* coping (p = .001), perceived illness *identity* (p = .000), and by perceived *emotional response* to having a heart attack (p = .000). Being a female vs male (p = .071) was at the borderline significance level. In total, this model, explains 33% of the variance.

Table 11.3

Third model of emotional-related quality of life in the combined samples

	% R^2_{Adj}	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Hospital4 vs Non-Hospital4	.334	4.33	-.33	-2.14	.033	-2.125 – -.085
Humour			.20	3.25	.001	.064 – .262
Identity			-.24	-3.94	.000	-.087 – -.029
Emotional response			-.36	-5.76	.000	-.091 – -.032
Female vs Male			-.11	-1.82	.082	-.420 – .026

As predicted, high score on illness *identity* and perceived *emotional response* were concurrently related with worse HRQOL.

This result shows that of the participants who were not admitted to Hospital 4 in the UK, those with worse perceived illness *identity*, worse *emotional response* to having a heart attack and using more *humour* coping, as well as being a male were found to have better *emotional*-related HRQOL.

11.3.2.2 Concurrent relationships between coping cognitions and illness beliefs with *physical*-related quality of life

This outcome measure is at the borderline significance level concurrently associated with the model in this study (F (28, 113) = 2.089, p = 0.53, R^2_{Adj} = .14). Associated variables included and perceived illness *identity* (p = .000), having an angina vs non-angina (p = .020), and age (p = .027). In addition, perceived *emotional response* (p = .064) is at borderline level. In total this model explains for 14% of the variance.

Table 11.4

Third model of physical-related quality of life in the combined samples

	% R^2_{Adj}	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Age	.141	2.089	-.17	-2.24	.027	-.024 – .001
Identity			-.29	-4.26	.000	-.137 – -.050
Angina vs Non-Angina			-.15	-2.34	.020	-1.167 – .099
Emotional response			-.13	-1.86	.064	-.072 – .002

As predicted, high score on illness *identity* and perceived *emotional response* were concurrently related with worse HRQOL.

This result suggests that older age, having perceiving worse illness symptoms and previous angina, concurrently associated with worse *physical*-related HRQOL.

11.3.2.3 Concurrent relationships between coping cognitions and illness beliefs with *social*-related quality of life

The third model is significantly concurrently associated with the model in this study (F (36, 233) = 2.192, p = .000, R^2_{Adj} = .152). Significant concurrently associated variables included age (p = .004), pre-existing diabetes vs non-diabetes (p = .044), *avoidance* coping (p = .008), perceived illness *consequences* (p = .014), perceived illness *identity* (p = .033) and perceived *emotional response* to having a heart attack (p = .024). Other variables are at the borderline significance level: recognition of having a heart attack (p = .067). In total this model explains 15% of the variance.

Table 11.5

Third model of social-related quality of life in the combined samples

	% R^2_{Adj}	*F* value	Standardised β	*t* value	*p* value	95% Confidence Interval
Age	.152	2.170	-.22	-2.89	.004	-.022 – -.005
Diabetes vs Non-Diabetes			.13	2.03	.044	.045 – .442
Avoidance			.22	2.66	.008	.028 – .321
Consequences			-.21	-2.49	.014	.049 – .390
Identity			-.15	-2.14	.033	-.128 – -.005
Emotional response			-.16	-2.27	.024	-.054 – .002
Realised had a heart attack			.12	1.84	.067	-.014 – .443

As predicted, high score on illness *identity* and perceived emotional response were concurrently related with worse HRQOL. Using *avoidance* coping in this early stage was concurrently related with better HRQOL.

This result suggested that younger age, pre-existing diabetes, used more *avoidance* coping, perceived less illness *consequences*, perceived worse illness symptoms, and perceived worse *emotional response* to having a heart attack, concurrently associated with better *social*-related HRQOL by 15%.

Based on this result, further analysis was conducted to determine the effect of country to the measured variables.

11.3.3 *Multivariate Analysis of Covariance*

It was hypothesised that the British-Indian/Pakistani sample will show a higher score on *spiritual* coping scale in the Brief-COPE compared with the British-

White sample, and the Indonesian sample will show a higher score than the UK sample, and the British-Indian/Pakistani sample will show a lower score on the *substance use* coping scale in the Brief-COPE compared with the British-White sample, and the UK sample will show a higher score than the Eastern sample. This section analyses differences between the UK and Indonesian samples. Multivariate Analysis of Covariance (MANCOVA) is designed to detect between-country differences whilst controlling for age.

MANCOVA has an assumption that the variables should be equal. Levene's test of equality of errors produced by SPSS during the analysis revealed that some of the illness beliefs and coping cognitions are not equal. These variables show a significance level of higher than .05. The variables which fit the MANCOVA assumptions are: perceived illness *timeline* (p = .14), perceived treatment control (p = .30), perceived illness *concern* (p = .26), *approach coping* (p = .08), *venting and using instrumental support* (p = .61), *avoidance coping* (p = .30), *positive outlook coping* (p = .75), *self-distraction* coping (p = .20), *using emotional support* coping (p = .51), and *humour* coping (p = .61). MANCOVA was able to report observed power for illness beliefs and coping cognitions on this combined UK-Indonesian sample.

The mean score for each illness belief is presented in Table 11.6. Indonesians have worse perceived illness *consequences*, perceived longer *timeline*, less perceived *personal control* over the illness, perceived more symptoms (*identity*), perceived more illness *concern*, perceived less *understanding* and worse perceived *emotional response* compared with the British-White group. Some illness beliefs, that is, perceived illness *timeline*, perceived *treatment control* and perceived illness *concern*, showed differences across countries.

Table 11.6

Mean score and standard deviation of illness beliefs between the three ethnic groups

	ILLNESS BELIEFS							
	Consequences	Timeline	Personal control	Treatment control	Identity	Concern	Understanding	Emotional response
British-White	3.86 (3.39)	3.73 (2.83)	4.31 (3.58)	8.07 (2.42)	3.05 (2.78)	4.20 (1.38)	5.35 (3.06)	2.50 (3.22)
British-Indian/ Pakistani	4.93 (3.21)	4.31 (2.87)	3.79 (3.34)	7.17 (2.56)	2.83 (2.80)	4.24 (3.56)	5.14 (3.15)	3.07 (3.42)
Indonesian	7.83 (7.35)	4.86 (3.18)	7.04 (2.57)	8.28 (2.43)	4.08 (3.41)	5.96 (3.66)	3.77 (3.40)	4.19 (4.08)

The most commonly adopted power is .80. Among illness beliefs the following had sufficient power to detect effect: perceived illness *concern* (1.00), perceived illness *timeline* (.36), perceived *personal control* (1.00), perceived illness understanding (.97), and perceived *emotional response* (.55). Six coping cognitions had a desirable observed power: *approach coping* (.84), *avoidance coping* (1.00), *positive outlook* coping (1.00), *substance use* coping (.92), *spiritual* coping (1.00), but insufficient for *self-distraction* coping (.14).

11.3.3.1 Comparisons of nationalities

MANCOVA revealed that, after controlling for age, some illness beliefs and coping cognitions which met the assumptions were significantly different between the two countries. There was a significant country effect on some illness beliefs

and coping cognitions (F (10, 231) = 23.80, p = .000). Specifically, there were differences in perceived illness *timeline* (p = .011), perceived *treatment control* (p = .000), and perceived illness *concern* (p = .028). There were differences among the following coping cognitions: *approach coping* (p = .035), *venting and using instrumental support* (p = .000), *self-distraction* (p = .003), *using emotional support* (p = .000) and *humour* coping (p = .001).

Mean scores for each illness belief are presented in Table 11.7. Indonesians used more *approach* coping, more *venting and instrumental support* coping, less *positive outlook* coping, more *avoidance* coping, less *substance* coping, use more *spiritual* coping, less *self-distraction* coping, and more *emotional support* compared with the British-White group. British-Indian/Pakistani group used the most *venting and instrumental* coping, most *positive outlook*, least *substance use*, the most *self-distraction* and use the most *emotional support* compared to the other the groups.

Table 11.7

Mean score and standard deviation of coping cognitions between three ethnic groups

	COPING COGNITIONS								
	Approach	Venting & Instrumental Support	Positive Outlook	Avoidance	Substance use	Spiritual	Self-distraction	Emotional support	Humour
British-Whites	2.19 (.78)	2.67 (.79)	2.86 (.66)	1.81 (.70)	1.41 (.66)	1.81 (1.04)	2.79 (.83)	3.14 (.77)	2.07 (.94)
British-Indian/ Pakistani	2.48 (.95)	2.87 (.74)	3.06 (.57)	1.80 (.75)	1.03 (.13)	3.03 (1.05)	2.81 (.60)	3.41 (.77)	1.67 (.79)
Indonesian	2.65 (.68)	2.77 (.73)	1.72 (.61)	2.69 (.64)	1.13 (.38)	3.19 (.89)	2.60 (.83)	3.20 (.81)	2.03 (.96)

11.3.3.2 Country differences in clinical risk factors

It was hypothesised that there would be a difference in health related behaviours and risk indicator variables between the UK and the Indonesian sample (see

section 6.2). To analyse different clinical risk factors associated with CHD in these two countries, a series of Chi-square tests were conducted on smoking habit, pre-existing diabetes, pre-existing high blood pressure, diagnosed angina and exercise habits.

Chi-square tests revealed that smoking and exercise habits were significantly associated with country. Chi-square tests revealed there was a significant association between Eastern and Western country on smoking and exercising regularly, but not on previously diagnosed angina, pre-existing diabetes or high blood pressure. There was a significant association between Indonesia and the UK regarding smoking (χ^2 (3, 243) = 75.52, p = .00), and exercise habits (χ^2 (1, 243) = 39.18, p = .00).

Smoking was more common among the Indonesian sample than in the UK sample. Although 33.6% of the Indonesian sample claimed never to have smoked, compared with none in the UK sample, more people within the Indonesian sample currently smoked (47%) compared with the UK (35%). Having quit smoking was also more common in the UK with nearly half of the sample having quit for 15 years or more (40%) and less than 15 years (25%) compared with 11% in both categories in the Indonesian sample. Of the combined smokers from both countries, 54% were Indonesian compared with 46% British.

Regarding exercise habits, the Indonesian sample was more likely to exercise than the UK. Nearly all of the UK participants did not exercise regularly (98%) compared to the Indonesian (68%). The UK sample consisted of more than a third of those who reported not exercising regularly. Nearly of the entire Indonesian sample claimed to exercise regularly (92%).

11.3.3.3 Coping cognitions between countries

A one-way ANOVA was performed to compare different types of coping cognitions between ethnicities, British-White, British South-Asian and Indonesian samples. The ANOVA revealed that there were significant country effects on *avoidance coping* (F (5, 237) = 22.40, p = .000), *positive outlook* (F (5, 237) = 44.42, p = .000), *substance use* coping (F (5, 237) = 4.32, p = .000) and *spiritual* coping (F (5, 237) = 23.23, p = .000). *Avoidance* and *spiritual* coping was more commonly utilised by the Indonesian sample, and *positive outlook* and *substance use* coping was more common among the UK sample.

11.3.3.4 Illness beliefs, coping cognitions and health-related quality of life in different ethnicities

Finally, to compare the effect of different ethnicities (British-White, British-Indian/Pakistani and Indonesian) on illness beliefs and coping cognitions, a one-way ANOVA was performed.

Using Levene's test for homogeneity of variance to check for assumptions prior to ANOVA, it was found that most variables have equal variances across the three ethnic samples. The variables showing a significance level of higher than .05, which meet the assumption, are: perceived illness *timeline* (p = .403), perceived *treatment control* (p = .307), perceived illness *concern* (p = .447), perceived illness *understanding* (p = .169), *approach* coping (p = .087), *venting and using instrumental support* (p = .709), *avoidance* coping (p = .385), *positive outlook coping* (p = .409), *spiritual* coping (p = .105), *self-distraction* coping (p = .166), *using emotional support* coping (p = .643) and *humour* coping (p = .604), but not perceived illness *consequences*, perceived *personal control*, perceived illness *identity*, perceived *emotional response* to an illness and *substance use*.

The following variables showed a significant effect: perceived illness *timeline* (F (2, 240) = 50.60, p = .000), perceived illness *concern* (F (2, 240) = 7.48, p = .025), perceived illness *understanding* (F (2,240) = 7.48, p = .001), using *approach coping* (F (2, 240) = 10.15, p = .000), using *avoidance* coping (F (2, 240) = 51.92, p = .000), opting *positive outlook* coping (F (2, 240) = 108.74, p = .000) and opting for *spiritual* coping (F (2, 240) = 56.31, p = .000).

Table 11.7 shows that the Indonesian sample have less favourable illness beliefs compared with the British-Whites and the British-Indian/Pakistanis. The scales range from 0 to 10. The Indonesian sample reported less favourable illness beliefs on most of its dimensions. The Indonesian sample perceived that their illness resulted in poorer consequences, perceived their illness to be longer, perceived their treatment to be less effective, perceived their illness symptoms to be worse, perceived more concern over their illness, perceived less understanding about their illness and perceived higher emotional response towards their illness. However, they also perceived having the most control over their illness and perceived a benefit from most from their treatments compared with the UK samples. The UK samples were least likely to use *avoidance* coping compared with the Indonesian sample. The British-White sample reported having the most favourable illness beliefs: perceived less consequences, perceived their illness to be shorter, perceived to have more understanding regarding heart attack and reported being least emotionally affected by having a heart attack compared with the Asian samples.

Table 11.7 also shows that the cognitive coping functioning across samples. The scale ranges from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot). The British-Whites ($M_{British\text{-}Whites}$ = 3.14), British-Indian/Pakistani ($M_{British\text{-}Indian/Pakistani}$ = 3.41) and Indonesian sample ($M_{Indonesian}$ = 3.20) preferred *using emotional support* as the main coping cognitions following a heart attack. *Positive outlook* coping is high among both of the British Whites (M = 2.86) and the

British-Indian/Pakistani (M = 3.06). *Venting and using instrumental coping* ($M_{British\text{-}Whites}$ = 2.69; $M_{British\text{-}Indian/Pakistani}$ = 2.87) and *self-distraction* ($M_{British\text{-}Whites}$ = 2.79; $M_{British\text{-}Indian/Pakistani}$ = 2.81) were also popular among the UK samples. In the Indonesian sample, *spiritual* coping ($M_{Indonesian}$ = 3.19), *avoidance* coping ($M_{Indonesian}$ = 2.69) and *approach* coping ($M_{Indonesian}$ = 2.65) were the preferred coping cognitions.

The mean score for dimensions of HRQOL are presented in Table 11.8. Indonesians were consistently experiencing worse HRQOL in all dimensions compared with the other groups.

Table 11.8

Mean score and standard deviation of HRQOL between the three ethnic groups

	HEALTH-RELATED QUALITY OF LIFE		
	Emotional	Physical	Social
British-Whites	5.15 (.71)	5.66 (.88)	6.07 (.76)
British-Indian/ Pakistani	5.07 (.67)	5.80 (1.06)	6.03 (.59)
Indonesian	4.71 (.81)	5.42 (1.08)	5.95 (.68)

The Indonesian sub-sample reported most often adopting *approach* coping, using less *substance*, adopting *spiritual* coping most often, but less *positive outlook* and using more *avoidance* coping compared with the UK samples. British-Indian/Pakistanis used venting and instrumental support most often, consuming least *substance*, were most likely to adopt *self-distraction* coping and used *emotional support* the most compared with the other samples. The British-Whites adopted some of maladaptive coping; they reported using substances most frequently, used less *spiritual coping* and used the least *emotional support* from others.

The Indonesian sample reported worse illness beliefs, coping cognitions and HRQOL compared with the British-Whites and British-Indian/Pakistanis. Regarding coping cognitions, the British-Whites utilised more maladaptive coping compared with their Asian counterparts.

11.4 Discussion

The aims of this study were: (1) to assess how different beliefs about heart attack and coping cognitions concurrently associated with heart-disease HRQOL in the UK sample; (2) to assess how these variables are concurrently associated with heart-disease HRQOL in the Indonesian sample, and (4) to assess how these variables are concurrently associated with heart-disease HRQOL in the combined UK and Indonesian sample. The results relating to the first aim were elaborated in Chapter 9, and the second aim in Chapter 10. The previous section in this chapter has covered the result of the combined sample. The general discussion for these cross-cultural studies will follow in this section.

The primary purpose of this study is to assess concurrent associations with HRQOL by the model proposed. It was found that illness beliefs and coping cognition variables were concurrently associated with aspects of HRQOL. These aspects were concurrently associated with the model proposed which explained between 13% and 41% of the variance. However, *the physical dimension* of HRQOL was found to be the most difficult to be concurrently associated with. In the UK sample, this was not significantly concurrently associated with the model. Similarly, in the Indonesian sample, this aspect only achieved a borderline significance level of .053. On the contrary, a proportion of the emotional dimension of HRQOL was concurrently associated with the model proposed; by 21% in the UK sample, 41% in the Indonesian sample and 34% in the combined sample.

In each single country studies and in the cross-cultural study, some illness beliefs and coping cognitions were concurrently associated with HRQOL. Among several illness belief components, more illness symptoms were concurrently associated with worse dimensions of HRQOL across all groups of the sample, with the exception of the *social* dimension of HRQOL in the Indonesian sample, where illness symptom beliefs were not a reliable concurrently associated factor. In addition, those who perceived high emotionality was concurrently associated with worse emotional and social dimensions of HRQOL in the Indonesian sample and in the combined samples, but not in the UK sample. Moreover, those without sufficient understanding about their heart attack were concurrently associated with better emotional and social dimensions of HRQOL in the Indonesian sample at this early stage of recovery. Finally, those who believed their medication will cure their disease were more likely to be concurrently associated with better social dimension of HRQOL.

The Indonesian sample reported the worst illness beliefs, followed by British-Indian/Pakistani and with the British-Whites. This is consistent with previous findings. A study of illness beliefs and adherence among Tongan and European descendant living in New Zealand with type 2 diabetes showed that the New Zealander-Tongans were more likely to reported more illness symptoms, reported less control of their disease, and not believing in their treatments compared to the New Zealander-Whites. These poor illness beliefs led to worse adherence.

Among the types of coping cognitions, using more *avoidance* coping was the most reliable concurrent association with the social dimension of HRQOL in both samples and in the combined sample. However, avoidance coping was concurrently associated with better social functioning among the UK and combined sample, but with worse functioning in the Indonesian sample. *Avoidance* coping scale in this study is identical with *denial* scale in the original *a priori* scales and one item of behavioural disengagement coping scale (see section

7.5). Many studies have confirmed the use of denial in this early stage (see review in section 4.3.6). Denial in the first month of having a heart attack is found to be associated with improved well-being, less anxiety and depression, but not at six and twelve months (Van Elderen *et al*., 1999). In addition, Lowe, Norman and Bennett (2000) studied concurrent associations between coping cognitions; emotional outcomes and perceived health among people with first-time heart attack during the past six months of adjustment were assessed using COPE scale, Global Mood Scale, State Anxiety Inventory and Health Complaints Scale. One hundred twenty-eight participants which included 93 men and 35 women were recruited during their stay in hospital. They were contacted for follow-up at two- and six-months. Seventy-four of these completed the three assessments. There were no difference between drop-outs and those who participate in relations of variables measured. Lowe *et al*. (2000) found that throughout three time-points, the most often used coping cognitions were *acceptance* coping, *problem*-focused coping, *social/emotion*-focused and *avoidant*-focused, respectively. These were stable with the exception of *problem*-focused coping. There was a significant increase in this coping cognition between in-patients and at two-months, but not between two and six months. Emotion and perceived health remained unchanged over time. It is possible that *problem*-focused coping will be utilised in this sample at a later time.

Particularly in the Indonesian sample, those who understand less about their disease were more likely to engage in *avoidance* coping (see section 10.5.2.3) in the preliminary analysis. This negative relationship between *avoidance* coping and illness *understanding* is supported with sub-patterns of denial as a type of avoidance coping proposed by Janis (1983), which are related to information preference. Janis proposed procrastination may appear in the association with information evasion. Having less understanding about heart attack and worse treatment control beliefs was concurrently associated with better emotional and

social dimension in this Eastern sample, as explained in the previous paragraph. Therefore, not having sufficient information was one of form of denial, in this sample. Another type of disengagement coping, the use of *self-distraction* coping following a heart attack was also a reliable concurrently associative factor of social dimension of HRQOL in the Indonesian sample. Self-distraction is also a coping strategies used in distancing oneself from a stressor (Carver, 1997).

The differences in usage of coping cognitions from difficulties to attain goals in the Eastern and Western sample may reflect the importance placed on these health goals. People in the Western sample may place health goals in a higher position than Eastern people. This may be related to more developed countries in the West and the fact that healthcare is free in the UK, where the NHS in the UK emphasises prevention in the form of health education, among other things. This is resulted in the increased awareness of CHD prevention. In the UK, information on CHD as a preventable disease is more accessible in hospital settings and in the media. This is not the case in Indonesia. Healthcare in this country is not free, other than for the lowest income group. Furthermore, in Indonesia, health goals may be accorded a lower value compared with individuals in the UK. In Indonesia, other values, such as fulfilling everyday necessities, caring for family members, are of higher importance than the health goals. This may in turn, be concurrently associated with worse HRQOL in this Eastern sample. HRQOL of the British-Indian/Pakistani sample is slightly lower than the Western sample, but higher than the Eastern sample.

Based on the reported use coping cognitions, *using emotional support* coping was the most widely used coping cognitions following a heart attack across three ethnicities. This finding supports the notion that social support plays an important role in healing. In a study of in-patients with type 2 diabetes Searle *et al*. (2007) in the UK (for full review, see section 4.4), *confrontation* coping is the most reported coping. Using the MCMQ, *confrontation* coping ('How much do you want to be

involved in decisions regarding your treatment'), which is not specifically defined in the Brief-COPE, reflects a logical coping style (Searle *et al*., 2007). This type of coping is related to problem-focused coping. In the British sample, *positive outlook* coping, *venting and using instrumental* coping and *self-distraction* coping in the British-Whites sample were also widely used, whereas among the British-Indian/Pakistani, *spiritual* coping, *positive outlook* and *venting and using instrumental* coping. Similarly, in the Indonesian sample, *spiritual* coping was also widely used along with *avoidance* coping and *approach* coping. The use of *avoidance* coping among the Indonesian sample at this stage is consistent with previous study in-patients, as explained in the previous paragraph. *Spiritual* coping is popular among the Eastern sample living in the East, as well as in those who lived in the West. There was a positive correlation between perceived illness *identity* in the Indonesian sample and *spiritual* coping (see section 10.5.2.3), which means those who perceived more illness symptoms were also more likely to turn to religion. In this Eastern sample, turning to religion following a recent heart attack may serve as a form of behavioural disengagement. It is possible that worse symptoms were being perceived as dying, and therefore using turning to religion as a coping strategy.

Some socio-demographic variables were concurrently associated with dimensions of HRQOL. Older age was concurrently associated with worse physical dimension of HRQOL in both the Indonesian sample and the combined sample, but better social functioning in the combined sample. This may be related to financial implications in relation to work and family responsibilities among the younger age group. In addition, gender also played a part in HRQOL. Being a male was concurrently associated with better emotional dimension of HRQOL in the combined sample. Finally, hospital of admission was found to be associated with *emotional*-related HRQOL in the patients with heart attack. Staying in one of the hospital in the UK was significantly concurrently associated with worse

emotional dimension of HRQOL in the UK sample and in the combined samples. The reason may have been due to lack of psychological care as Bennett and Hobbs (1990) suggested that there are factors that play an important part in the psychological care of acute stage coronary patients. This can include providing emotional care, giving a sense of personal control, encouraging patients to distract themselves from boredom or worries and providing opportunities for formal or informal counseling. These factors emphasis not to only medical care, which includes Ward/Coronary Care Unit, provides cardiac patients medical care and information regarding their heart attack, treatment and prognosis; but also on the cognitive and emotional level (Bennett & Hobbs, 1990). The service provided by Cardiology Department of this hospital has high success rates for their range of procedures. Their outcomes for angioplasty and stenting are comparable with those of the major US centres. The service offered is internationally renowned. This cardiology unit is one of the first '24/7' angioplasty centres following heart attack and it is the first 3-star echocardiology department in the UK. This suggested that this UK hospital is able to provide an excellent medical service. However, this hospital may not provide sufficient psychological care, as needed for people with recent heart attack, as suggested by Bennett and Hobbs (1990). As a referenced hospital, many of the cardiac patients were transferred from other hospitals. As a result, family visitation may have been limited due to distance. Family can serve as social support and can provide emotional care to the patients. Another explanation is the population diversity to the hospital of admission may also play a part. Diverse population in the UK requires a more culture-sensitive approach and tailored programmes targeting for ethnic minorities which are more susceptible to CHD. The reason may be related to the location of the hospital, which is in the inner London, compared to the other hospitals in the UK. This phenomenon was not found in other sites, which may also suggest that the emotional experiences of the populations of those living in inner and outer London

are not similar. However, it is worth noting that this finding was as the result of exploratory analysis and not hypothesised prior to the study.

Some clinical variables also concurrently associated with HRQOL. Having previous angina in the past was concurrently associated with worse *physical* aspect of HRQOL in the mixed sample. On the contrary, having pre-existing diabetes was concurrently associated with better *emotional* aspect of HRQOL in the UK sample and better *social* aspect in the combined sample. This may suggest that previous angina predicts worse illness progression.

The use of coping cognitions is different in the population of older age. A study in the US by Leslie, Waid and Fincke (2002) described coping strategies used to manage anxiety among older adults. This involved ninety-one relatively healthy participants between the age 60 to 92, with mean age 72.3 (SD = 6.2). Anxiety sensitivity was measured using Anxiety Sensitivity Index to assess the degree of fear, concern, or anxiety experienced in response to one's own physiological, somatic sensations, or anxiety symptoms. Distress was measured using Perceived Stress Scale to assess the degree to which current situations in one's life are appraised as stressful and cause distress. The original COPE was used in this particular study, but whenever possible, the scales were transformed into the later ones for comparison with this current study. Leslie *et al*. (2002) found that those with higher anxiety sensitivity were more likely to regulate their emotional responses to stress, or to try to mentally or behaviourally distance themselves from their stressors. They also found that higher current situational distress was related with more active use of problem-solving strategies as well as great tendency to distance or disengage from the problem. Anxiety sensitivity was positively correlated with *behavioural disengagement*, *positive reframing*, and negative emotional regulation ("I let my feelings out"), and with *using emotional support*. Distress was negatively correlated with *active coping*, and *planning* ("I try to come up with a strategy about what to do"). Distress was positively correlated with both

behavioural disengagement ("I gave up the attempt to get what I want") and *self-distraction* coping. Distress was also positively correlated with *restraint coping* ("I hold off doing anything about it until the situations permits") and negatively correlated with *positive reframing* coping. Anxious older adults used less effective coping strategies, such as *emotion regulation* coping, *behavioural disengagement* coping, and *denial* to manage their anxiety than did less anxious older adults. Anxious older adults also altered their coping strategies to anxious symptoms, suggesting they differentially allocate psychosocial resources to cope with anxiety, but this allocation may not be adaptive in anxious elderly individuals.

Some illness beliefs, *timeline*, *treatment control* and *concern*, were shown in differences between-country. The importance of such beliefs has been highlighted previously in Chapter Four. Modification of these beliefs had been found to improve their views about their heart attack, more prepared in leaving hospital and earlier return to work (Petrie *et al*., 2002). In addition, Cooper *et al*. (2007) have developed a tool to measure beliefs about CR programmes to differentiate non-attenders to attenders.

It is important to note the smoking prevalence in both countries. The prevalence of smoking is higher in the Indonesian sample than in the UK sample where 47% of the Indonesian sample and only 35% of the UK sample were current smokers. In addition, quitting smoking is also more common in the UK than in the Indonesian sample. Abstinence from smoking was found in around a third of the Indonesian sample compared with none in the UK. More than half of the total smokers from both countries were Indonesian. The British-Indian/Pakistani group were also more likely to smoke compared with their British-Whites counterparts. The tendency for Asian migrants to consume more tobacco was also observed in other studies. For example, a study of 253 Swedish-immigrants aged 55-74 were more likely to smoke, compared with 2847 Swedish-born people after adjusting

for age, sex, socio-economic status and other background variables (Pudaric, Sundquist & Johansson, 2000). Low income for all groups was related with an increased BMI. This finding highlights the importance of intervention to promote smoking cessation programmes in Indonesia, as well as among the British South-Asians. Prevention of smoking is also important to promote among the younger generations.

For physical activity among these groups, the Indonesian sample was more likely to exercise than the UK sample. Nearly the entire UK sample did not exercise regularly (98%) compared with 68% of the Indonesian. More than a third of those who reported not exercising regularly were in the UK sample. The majority of this UK sample was older males which may explain this finding. A similar finding was reported where older male samples were likely to be inactive, although this is more significantly among immigrants (Pudaric *et al*., 2000).

Finally, the minority ethnic group in the UK did not show an acculturation process. The behaviour of the British-Indian/Pakistani group mirrored that of those in the East regarding spiritual beliefs, smoking habits, substance abstinence and CHD risk. This is contrary to the findings of a previous study on Japanese people who had migrated to the US (see section 2.8.3), ethnic minorities group in the UK did not show an acculturation process compared with the American-Japanese, particularly those who resided in San Fransisco. The explanation may be that in UK society minority ethnic groups are allowed to retain their traditions, and diversity is accepted, compared with the US where the pressure to conform is higher.

The following is the final part of this thesis. It contains discussion regarding the limitations of this study, its implications and finishes with a conclusion.

PART FIVE: CONCLUSION

Following the discussion of the study in Indonesia and the UK, this part will conclude the thesis. This final chapter includes a discussion of the limitations of this study along with a discussion of the implications for future studies and for clinical practice.

CHAPTER 12 CONCLUSION

12.1 Introduction

This chapter begins with a summary of the findings of this cross-cultural research study. This is followed by a discussion of the strengths and limitations of this study, and the contributions of this study for the clinical setting, health policy and future research. Finally, there are brief concluding comments.

12.2 Summary of findings

Using the CSM model, this study proposed that cultural and socio-economic background in the East and the West would emerge in differences among the ways individuals manage their health threats and cope with their fear and distress, which in turn might influence their HRQOL as a health goal.

The results presented in Part Four highlight the cultural differences in the responsiveness of two measurements used in UK and Indonesian sample (see Chapter Seven and Chapter Eight). Results from the questionnaire adaptations, particularly the B-COPE scale between the Indonesian and the UK and the original *a priori* scales, highlighted differences in how individuals cope with fear and distress following a heart attack. In both the UK and Indonesian sample, two factors were consistent with the *a priori* scales: *spiritual* coping and *humour*, suggesting that individuals in these countries utilised humour and religion after a heart attack event. However, it is worth noting that about a quarter of the UK sample consisted of British-Indian/Pakistani people. It is possible that these sub-

groups may have been utilising *spiritual* coping more than their British-White counterparts.

In addition, *self-blame* also appeared as a significant feature in the Indonesian sample, but not the UK sample. In this sample, *self-blame* appeared to be positively correlated with *active coping*. This may confirm previous findings that self-blame is a salient characteristic in Eastern cultures, for example, in Japanese people (Lebra, 1983). Self-blame, as explained in Chapter Four, is related with guilt and shame.

Furthermore, the relationship between self-blame and active coping may have been due to individuals' sense of control towards life events, which is shown in an earlier study of rape victimisation. Janoff-Bulman (1985; 1979) concluded that blame of others was associated with poor coping, but self-blame was a predictor of good coping. She explained that behavioural self-blame is adaptive as it involves blaming oneself, whereas characterological self-blame is maladaptive as it involves attributing one's personality characteristics (Janoff-Bulman, 1979). She further explained that the fundamental difference between these self-attributions is the perceived modifiability and controllability of the blamed factor. Behaviours are generally regarded as modifiable through efforts, whereas personality traits are stable and more difficult to change. Behavioural self-blame enable one to believe in the avoid ability of victimisation in the future by behavioural modification (Janoff-Bullman, 1985). Therefore, one can avoid being victimised in the future as well as having personal control over future misfortune. On the contrary, characterological self-blame focuses on the past and questions deservedness instead of finding ways to avoid future misfortune. Consistently, in the case of a recent heart attack, individuals in the East who showed the highest *self-blame* coping score also showed the highest *personal control* coping, nearly double the score of their British Indian/Pakistani counterparts. This self-control is crucial for behaviour change. Therefore, *self-blame* coping in the Indonesian sample can

enhance health behaviour modification, such as quitting smoking, healthy diet consumption and improving ones fitness level.

In the UK sample, *using emotional support* was clearly separated from *using instrumental support* but not in the Indonesian sample. The *Denial* and *substance use* coping scales appeared together in the Indonesian sample, but were defined separately in the UK sample. This may be related to the fact that in Eastern culture and/or predominantly Muslim culture, the use alcohol is suppressed.

Furthermore, within the UK sample, there was an ethnic difference in relation to *substance use* coping. The British-White sample was more likely to utilise this coping cognition compared with their British-Indian/Pakistanis counterparts. This may be related to beliefs, religious reasons or access to alcohol. Also, women in the UK sample were found to be more likely to use *spiritual* coping than men.

This study found similarities and differences in the pattern of socio-economic and clinical variables. With regard to similarities the following point was noted. The mean age of the UK sample was 68 years compared with 54 years in the Indonesian sample. However, the UK sample showed a wider age range of from 24 to 92 years of age, whereas the Indonesian range was limited to between 33 and 79 years. This reflects the UK life expectancy of 77 years for men and 81 years for women, in comparison to the Indonesian's general life expectancy of 70 years. When divided into two age groups, younger and older groups, the younger group, aged between 20 to 59 years, in the Indonesian sample demonstrated more than twice the risk (75%) for heart attack compared with the UK sample (33%). Conversely, only a quarter of the Indonesian sample fell within the older age group (60 to 99 years) compared with two-thirds of the UK sample. This suggests that the Indonesian population are at risk of heart attack at a far younger age than the UK sample, and that fewer people experience heart attack at an older age in Indonesia as life expectancy is considerably foreshortened.

Another similarity between these samples regards the sex ratio. In both of these samples, there is a similar over representation of males, but the degree of disproportionality is considerably higher in the Indonesian sample.

With regard to differences in lifestyle risk factors, the most striking difference between the Eastern and Western samples was found in tobacco consumption. Nearly half of the Indonesian sample were current smokers compared with less than a quarter of the UK sample. The proportion of non-smokers in Indonesia is half that of the UK. Finally, the proportion of patients who had quit smoking in Indonesia was also lower than the UK.

This study found that both the single country analyses and the combined sample analysis confirm previous findings that illness beliefs and coping predict HRQOL. Socio-demographic and clinical variables, were linked to illness beliefs and coping cognitions in both countries. Differences in age and gender were found to use different types of illness beliefs and coping cognitions.

The emotional and social dimensions of HRQOL were found to be predicted between 19% and 21% using the proposed model in the UK sample. In the Indonesian sample, however, these dimensions were predicted by 41% and 14% respectively. However, in both countries, this model failed to predict the physical dimension HRQOL. Improved emotional aspect of HRQOL in the UK was predicted by having pre-existing diabetes and less perceived symptoms of heart attack. In the Indonesian sample, this dimension was predicted by coping cognition (*humour*), illness beliefs (*identity*, *understanding*, *emotional response*) and not having a high blood pressure. The social dimension in the Indonesian sample was predicted by coping cognitions (*positive outlook*, *avoidance* coping, *self-distraction* coping) and illness beliefs (*personal control*, *treatment control*, *understanding* and *emotional response*). Similarly, in the UK sample, better social

dimension was predicted by using *avoidance* coping and having less perceived symptoms.

The differences in cognitive representations among individuals in the East and West when faced with CHD threats, and how they coped with the emotions arising, may have been related to the subjective importance of goals. Although state of health is important for individuals, other issues could also play roles in determining the degree of importance of health goals between the Indonesian and UK samples. These issues could be related to the financial situation, work-related or family-related factors, or other personal factors. Bodily symptoms and pain may have been dismissed to avoid seeking medical care when medical costs were high, whereas this delay may have not occurred when healthcare was free of charge. Although the Indonesian government has recently implemented free healthcare for people with low income, not all people have been informed about such schemes. These schemes also have limitations as to the treatments provided and therefore, access to available treatments would differ between people who can afford to pay treatments and those who cannot.

Another important issue is that being of a younger age means that the Indonesian sample, particularly males, were in the working age groups. Spending time in hospital in most cases could result in the loss of income through days off sick. This could add to more stress on returning to work compared with people in the retired age group. Loss of income is also significant, particularly for those with young children.

This study also found that people with a heart attack in Indonesia experienced worse HRQOL and generally spent longer in hospital than the UK sample. This was a result of socio-economic differences rather than cultural differences. Low access to healthcare may have resulted in these conditions. In addition, the high smoking rate as mentioned in section 3.4.2 where 63.2% of males are smokers

contributed to this worse medical condition. These high numbers of active smokers increased the chance of others being affected through second-hand smoke.

Finally, this study has confirmed that there are differences in social and cultural systems between people in the East and in the West as well as people from the East who live in the UK as a minority. Although the emphasis of self-regulation theories is on internal processes and mechanisms, it is important to acknowledge that these processes take place in the socio-cultural context. The knowledge structures of illnesses, health and treatment methods reflect experiences within the family, neighbourhood, community and society at large (Jackson *et al*, 2000). Furthermore, socio-economic circumstances can either constrain or permit health-related behaviour and influence cognitive and affective experiences when dealing with health threats (Baumann, 2003). Self-regulation theory examines the relationship between individuals and environment. Differences in the context of socio-economic circumstances in the UK and in Indonesia are reflected in differences in constructions of illness, development of desires and goals, identification of strategies for coping, reference values for appraising progress, affective responses, and emotional regulation. Strengths and limitations of this research

12.2.1 *Strengths of this research*

The strength of this study lies in the cross-cultural element. Previous studies have been concentrated in the West, and in the East this area is understudied. This is the first study of two countries, representing Eastern and Western culture, comparing illness beliefs, coping cognitions and HRQOL. This study also adds to the understanding of illness beliefs and coping cognitions of Eastern people. Furthermore, it also adds understanding of illness beliefs and coping cognitions of

Eastern people living in the UK, and of cross-cultural differences in self-regulation following a heart attack.

Using an existing robust model of self-regulation theory in the health and illness context, this study found significant differences in cognitive and affective responses to a heart attack among people in the East and West, as well as Eastern people living in the West. This study is the first to be conducted using the CSM as a framework to examine cross-cultural health goals.

Also, this study used existing tools, which have been widely used in measuring illness beliefs, coping cognitions and HRQOL. All of these tools have been found to have good reliability.

Finally, this study has filled a gap in research on CHD in the Indonesian population. There have been no previous studies conducted on this population to measure their cardiac illness experience, coping cognitions. Therefore, this study has provided more understanding of the CSM in an Eastern sample. Moreover, the results of this study give insight into this understudied population for policy makers in Indonesia to take necessary actions (see section 12.4.3 below).

12.2.2 *Limitations of this research*

There are some limitations to this study. Regarding samples from both countries, this current study is using sequential sampling technique (see section 6.4). Therefore, the findings of this study should be generalised to the UK and Indonesian population with caution. This sampling technique has been commonly used in previous studies (e.g. Nazroo, 1997). It was designed to reach people experiencing CHD while in hospital. Hospitals were chosen based on the availability of cardiac wards and the area in the UK was targeted to gain more access to British ethnic minorities, so the sampling technique had a purposive

element. Similarly, one of the hospitals in Indonesia was a clear choice for being a centre for cardiovascular disease and was located in the capital. In regard to this matter, this thesis has been careful not to over-generalise the findings.

Furthermore, there have been issues raised regarding the coping measurements as explained in section 4.7.1. In this study, coping cognitions were measured with the Brief-COPE. Coyne and Gottlieb (1996) suggest that the study of coping should involve specifying meaningful patterning and irregularities between the individual and the environment. They continue that this can be achieved by contextualising the occurrence of a particular stressful episode within a larger social process, to identify how individuals find themselves in such a situation at a particular time, and to identify what they bring to these situations which allow the interpretation of coping. Some of their criticisms apply to the Brief-COPE. For example, one of their points is that, although the instructions refer to the stress of a current heart attack, some items can appear to relate to general daily living activities. Also, the Brief-COPE uses the word "trying" and "try", for example "trying to see in a different light, to make it more positive", which is prone to the effects of social desirability and self-presentation. Therefore, results from coping measurements should be interpreted with caution.

Further, the questionnaires in this study were researcher-administered, which may have increased the tendency of a social desirability effect compared with self-administered questionnaires.

Another limitation includes the questionnaire that was used in this study. The statements in the MacNew questionnaire referred to "the last two weeks" and this may not fully reflect the conditions in the current sample. Patients in the UK and, depending on their medical condition, most patients in Indonesia spent less time in the emergency wards. Therefore, the MacNew questionnaire was administered between one to two weeks after heart attack, and while they were still in hospital.

Some items also queried their condition after returning home. These items may have affected the internal reliability of this questionnaire. However, this study aimed to examine in-patient illness beliefs and coping cognitions, and use these in association with HRQOL. In order to counter this threat, participants in this study were asked to foresee their conditions after returning home.

This study conducted in specific areas of the countries. The UK study was conducted in six hospitals around London and the south east. The Indonesian arm of this study was conducted in two hospitals in the capital, Jakarta, on the island of Java. This would affect the generalisability of this study. However, to conduct country-wide studies in two countries would need a significant amount of resource. Therefore, these regions are the most populous areas of each country and are situated in and around the capitals. Thus, this cross-cultural study has chosen two comparable and representative urban and suburban areas.

Another limitation regards the sample size. Even though power calculation was used prior to data collection, this study could have benefited from a larger sample due to the number of the sub-groups to be analysed.

Finally, the study cannot claim a cause and effect relationship between illness beliefs, coping cognitions, and the outcome measure of HRQOL. Instead of measuring these as predictors of HRQOL, this study measured the associations between these variables to the outcome measure. As a result, the variables are merely treated as though they were predictor and outcome variables, but no statement of causality or direction of causality can be formulated.

12.3 Implications of this research

There are several contributions of this research covering clinical, policy and for future research.

12.3.1 *Clinical implications*

It has been revealed that, compared with the East, people experiencing heart attack in the UK are likely to be older and less likely to exercise. This finding is important information for CR staff. Research has shown that exercise-based CR programmes are beneficial and safe for this population (Ades, Maloney, Savage, & Carhart, 1999a; Ades, 1999b; Ades *et al.*, 1996). Therefore, a tailored-made community CR programmes might be more beneficial for this population.

In addition, there is a need for education on alcohol consumption, particularly in British-Whites as they are more likely to utlise substance use coping compared with the other samples. In addition, Byrne *et al*. (2005) in their study found that alcohol consumption was mostly found among people with CHD who reported higher control over their disease. Therefore, this particular education is important to be delivered to people with high *personal control* beliefs who regularly consume alcohol.

Previous studies indicate that exercise-based CR is beneficial for people experiencing heart attack. Currently, CR programmes in Indonesia are offered only to patients who have undergone CABG, stroke patients and other coronary artery diseases. Such programmes should be offered to MI patients as well. A benefit of these group-based CR programmes is that they may facilitate social and professional support, which could improve their HRQOL.

CR programmes should include a classroom-based intervention to facilitate the assessment of illness beliefs. Petrie *et al*. (2002) found benefits of an intervention to alter illness beliefs (see section 4.3.1). As indicated by the findings in this study, people experiencing a heart attack in Indonesia reported having a less informed understanding of CHD and worse illness beliefs in general compared with the individuals in the UK. This can be improved by the provision of

information by staff members, as well as through the media, such as posters and leaflets can also give information regarding their heart attack.

The future benefit of accurate and positive illness beliefs had previously been reported: believing in treatments will result in better medication adherence; low emotional response is related to improved exercise adherence (Byrne *et al*., 2005). Therefore, this emphasise the importance of educating people with recent heart attack. Moreover, some of the findings in this study showed relationships between illness beliefs, coping cognitions and HRQOL. These findings are useful to be applied as behavioural indicators. Using the findings in this study, health professionals can identify that people who complains of more symptoms since this is associated with worse HRQOL; and younger people with recent heart attack since this is associated with worse social functioning. Particularly for health professionals in the East, people with a recent heart attack who deny their conditions are unlikely to have sufficient information about their disease. As a result, appropriate interventions can be applied.

Health professionals could also use the results of this study to indicate which coping strategies should be encouraged in heart attack patients. Some coping cognitions may be adaptive to one particular cultural group, but not necessarily to another. For example, *spiritual* coping is salient in Eastern culture, including first-generation immigrants from the East. Furthermore, the results of this study only apply to the period immediately following heart attack, i.e. while still in hospital. Lowe *et al*. (2000) pointed out that problem-focused coping strategies may be more adaptive later on in the recovery period

Moreover, this study has revealed that hospital of admission has an impact on the emotional aspect of HRQOL following a heart attack. It suggests that hospitals which can offer quick and reliable interventions, centres of medical excellence, may put less emphasis on psychological support, thus impacting on the emotional

dimension of HRQOL. Due to the inner London city location, this finding may also suggest that people living in the centre of London have a different social profile and are perhaps prone to a lower emotional aspect of HRQOL. Hospital 4 also receives referral patients from other hospitals, which may result in fewer visitors during hospital stay compared with the other sites. The diverse population in the UK requires a more culture-sensitive approach and tailored programmes targeting ethnic minorities groups, particularly those who are more susceptible to CHD.

It is strongly recommended that the structure provided by the IPQ should be used as a basis for assessing all heart attack victims in order to identify risky or inaccurate cardiac illness beliefs that might be amenable to interventions.

12.3.2 *Implications for policy*

The most important implications of this research are at the government level of health policy towards tobacco in Indonesia. People in Indonesia are more exposed to higher nicotine level than those available in the UK and are also more affordable. However, as described previously, government policies tend to emphasise the economical benefit and creation of jobs, ignoring the health costs of smoking.

In addition, the new policy in the US to reduce tobacco consumption will force tobacco companies to invest more in the developing world. Their investments will most likely be able to influence policy makers in these developing countries to their benefit. They are targeting the vulnerable populations of young people and people with lower education (Mohamad, 2009). This situation is already happening as Centres for National Research University of Indonesia has reported the current trend of young smokers, particularly in rural areas.

Policy maker should consider that the WHO launched a campaign to reverse the tobacco epidemic globally. They formulated six policies to tackle this global pandemic. These policies are: (1) **m**onitor tobacco use and prevention policies; (2) **p**rotect people from tobacco smoke; (3) **o**ffer help to quit tobacco use; (4) **w**arn about the dangers of tobacco; (5) **e**nforce bans on tobacco advertising, promotions and sponsorship; (6) **r**aise taxes on tobacco. It is abbreviated as 'mpower'. The UK government has strong regulations and monitoring against tobacco use and is aware of the burden to the NHS. Smoking in public places has been banned to protect people leaving very little space in which people can smoke. At the same time as this 'push' method, the quit smoking campaign in the NHS has offered support and intervention. Advertising has been banned for a decade, and in the near future, displaying cigarettes in shops will also be banned. Taxes on tobacco are relatively high. However, the condition is the reverse in Indonesia (see section 3.5.2). In this developing country, the government has little power to control the smoking pandemic. Smoking in public places has been banned recently, but implementation is not uniform because commercial places are allowed to choose to have separate area for smoking. This opportunity has been utilised by tobacco companies to provide a smoking lounge, which is latent advertising.

Therefore, the results of this study will increase the urgency to influence these conditions from policy makers and programme development in Indonesia to reduce health disparities. A previous tobacco study in the rural and urban area by Centre for Health Research University of Indonesia (2001) (see section 3.4.2) suggested that the result of this urban study may not reflect an underlying problem in the rural area, which covers most of this country. The previous study has highlighted the smoking problem in the rural area, which was not covered in the Indonesian sample of this study. Centre for Health Research University of Indonesia (2001) also reported that nearly all boys in the youngest age group of 10 to 14 year olds have tried smoking. This prevalence study and the current study

took place are in the island of Java where access to health care and education is higher than most other areas of Indonesia, indicating that it is possibly worse outside these areas. This highlights the need for national health education on smoking to raise awareness among school age children. The government also need to take action include raising tax on tobacco similar to those of the UK. Higher pricing of tobacco has been found to decrease tobacco consumption. Higher tax could also increase government income which can be allocated to free healthcare.

12.3.3 *Implications for future research*

As a result of this study, adaptations of Brief-Illness Perceptions Questionnaire, Brief-COPE and MacNew Heart-Disease Health-Related Quality of Life are now available in the Indonesian language.

This is a cross-sectional correlational survey study. This means no causal interferences can be made. Therefore, a follow-up study of people with CHD exploring their illness beliefs, coping cognitions and HRQOL at one, three and six months following hospital admission in the East and West would be important to capture the dynamic of self-regulation of health and illness as it has been found that *problem-focused* coping cognitions change between in-patient stay and at two months later, but not between two and six months (Lowe *et al*., 2000).

This current study was conducted in the London and the Southeast. A similar study in the UK which includes other regions and rural areas, such as the north of England, Wales, Scotland and Northern Ireland, would also provide a more valid picture of the UK. Similarly, in Indonesia, where the current study was conducted in the capital, extending this research to other regions in the island of Java and in other islands would provide a more thorough picture of health conditions following a heart attack among Indonesian people.

There is a need to conduct research on the prevalence of CHD risk factors in Indonesia. Similar to the APCSC study (see section 3.4), a follow-up study of healthy sample across the areas of Indonesia is needed. APSCS study found that studies from Asia are rare and those which has been conducted tend to be small size or small duration. The current study provides some information on socio-economic and clinical factors. Therefore, there is an urgency to conduct a longitudinal study that provides reliable information on CHD risk factors in Indonesia. Records should include data on height, weight, BMI, blood pressure, glucose level, family history related to diseases, smoking habits, and exercise habits, as well as socio-economic and clinical information as measured in this study.

There is a need to conduct research on risk factors of CHD in Indonesia. Similar to the APCSC study (see section 3.4), a follow-up study of healthy sample across the areas of Indonesia is needed. APSCS study found that studies from Asia are rare and those which have been conducted tend to be small size or of small duration. The current study provides some information on socio-economic and clinical factors. Therefore, there is an urgency to conduct a longitudinal study that provides reliable information on CHD risk factors in Indonesia. Records should include data on height, weight, BMI, blood pressure, glucose level, family history of related diseases, smoking habits, and exercise habits, as well as socio-economic and clinical information as measured in this study.

Finally, the report in this thesis included borderline significant results. This is useful for future studies using the CSM with similar samples to decide on the number of their participants included.

12.4 Conclusion

This study set out to compare the internal processes of self-regulation, both cognitive and affective, and their relationships with cardio-specific quality of life within two contrasting cultures – East and West. The findings in this study support the CSM in explaining cardiac-related behavior.

However, the CSM has previously been criticised for ignoring the external environment. This study addressed this concern by revealing that factors including access to health care, the availability of health information, health policies and social support, all play a part in the formation of cardiac illness perceptions, coping strategies, and are thus associated with HRQOL.

REFERENCES

Aalto, A.-M., Aro, A.R., Weinman, J., Heijmans, M., Manderbacka, K., & Elovainio, M. (2006). Socio-demographic, disease status, and illness perceptions predictors of global self-ratings of health and quality of life among those with coronary heart disease – one year follow-up study. *Quality of Life Research*, *15*, 1307-1322.

Abouguendia, M., & Noels, K. (2001). General and acculturation-related daily hassles and psychological adjustment in first- and second-generation South Asian immigrants to Canada. *International Journal of Psychology*, *36* (3), 163-173.

Ades, P. (1999b). Exercise training in the special population: The elderly. In N. K. Wenger, L. K. Smith, E. S. Froelicher, & P. M. Cormoss (Eds.) *Cardiac rehabilitation in the 21st century* (pp. 109-118). New York: Marcel Dekker, Inc.

Ades, P., Maloney, A., Savage, P., & Carhart, R. (1999a). Determinants of physical functioning: Response to cardiac rehabilitation. *Archives of Internal Medicine*, *159* (19), 2357-2360.

Ades, P., Waldman, M. L., Meyer, W. L., Brown, K. A. Poehlman, E. T., Pendlebury, W. W., . . .LeWinter, M. M. (1996). Skeletal muscle and cardiovascular adaptations to exercise in older coronary patients. *Circulation*, 94, 323-330.

Ahmad, W. I. U. (1996). The trouble with culture. In D. 1 and S. Hillier (Eds.), *Researching cultural differences in Health* (pp. 190-219). London: Routledge.

Airhihenbuwa, C. O. (1995). *Health and culture: Beyond the western paradigm*. California: Sage Publications.

Alfredson, L., Karasek, R. A., & Theorell, T. (1982). Myocardial infarction risk and psychosocial work environment: An analysis of the male Swedish working force. *Social Science Medicine*, *16*, 463-467.

Allender, S., Peto, V., Scarborough, P., Kaur, A., & Rayner, M. (2008). *Coronary heart disease statistics 2008*. British Heart Foundation.

American Heart Association. (2002). Heart and stroke statistical update. Retrieved May 25, 2007, from www.americanheart.org.

Anthonisen, N. R., Skeans, M., Wise, R., Manfreda, J., Kanner, R. E., Connettt, J. E., & for the Lung Health Study Research Group. (2005). The effects of smoking cessation intervention on 14.5-year mortality. *Annals of Internal Medicine*, *142*, 233-239.

Antman, E. M. (2008b). ST-elevation myocardial infarction: Management. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1234-1292). Philadelphia: Saunders Elsevier.

Antman, E. M. & Braunwald, E. (2008a). ST-elevation myocardial infarction: Pathology, pathophysiology, and clinical features. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1207-1230). Philadelphia: Saunders Elsevier.

Appels, A. (1991). Behavioral changes before myocardial infarction. In A. Appels (Ed.), *Behavioral observation in cardiovascular Research: Workshop on behavioral aspects of cardiovascular disease*. Amsterdam: Zwets & Zeitlinger.

Arber, S., & Lahelma, E. (1993). Inequalities in women's and men's ill-health: Britain and Finland compared. *Social Science and Medicine*, *37*(8): 376-386.

Asia Pacific Cohort Studies Collaboration (2005). Smoking, quitting, and the risk of cardiovascular disease among women and men in the Asia Pacific region. *International Journal of Epidemiology*, 34, 1036-1045.

Asia Pacific Cohort Studies Collaboration (2003). Cholesterol, coronary heart disease, and stroke in the Asia Pacific region. *International Journal of Epidemiology*, 32, 563-572.

Bagozzi, R.P., Dholakia, U.M., & Basuroy, S. (2003). How effortful decisions get enacted: The motivating role of decision processes, desires, and anticipated emotions. *Journal of Behavioral Decision Making*, *16*, 273-295.

Balarajan, R. (1996). Ethnicity and variation in the nation's health. *Health Trends*, *27*, 114-119.

Bandura, A. (1986). Fearful expectations and avoidant actions as coeffects of perceived self-inefficacy. *American Psychological Association*, *41*.

Barefoot, J., Dahlstrom, W.G., & Williams, R.B. (1983). Hostility, CHD incidence, and total mortality: A 25-year follow-up study of 255 physicians. *Psychosomatic Medicine*, *45*(1), 59-63.

Barker, A., Tsakirides, C., Carroll, S., & Ingle, L. (2009). Physical self-efficacy, anxiety and depression following a 6-week cardiac rehabilitation programme. *British Journal of Cardiac Nursing*, *4*(5), 223-227.

Barth, J., & Bengel, J. (2000). Prevention through fear?: The state of the fear appeal research. In K. Salice-Stephan & H. Reeman (Eds.) *Research and practice of health promotion: Vol. 8*.

Bauman, C. B. (2003). Culture and illness representation. In L. Cameron & H. Leventhal (Eds.) *The self-regulation of health and illness behavior* (pp. 242-253). London: Routledge.

Baumeister, R. F. (1986). *Identity: Cultural change and the struggle for self*. New York: Oxford University Press.

Beishon, S., & Nazroo, J. Y. (1997). *Coronary heart disease: Contrasting the health beliefs and behaviours of South Asian communities*. London: Health Education Authority.

Bell-Duijndam, R., Thormar, S., & Verhoeven, C. (2004). *The effect of approach-avoidance coping and illness perception on the quality of life of Icelandic MI patients* (Master's Thesis). Leiden: Universiteit Leiden.

Bennett, P., & Lowe, R. (2008). Emotions and their cognitive precursors: Responses to spontaneously identified stressful events among hospital nurses. *Journal of Health Psychology*, *13*(4), 537-546.

Bennett, P. (1994). The psychological of the coronary patient. *Journal of Mental Health*. 477-478.

Bergner, M., Bobbit, R.A., Carter, W.B., & Gibson, B.S. (1981). The Sickness Impact Profile: Development and final revision of a health status measure. *Medical Care*, 19, 789-805.

Bethell, H., Lewin, R., & Dalal, H. (2009). Cardiac rehabilitation in the United Kingdom. *Heart*, *95* (4), 271-275.

Bosworth, H. B., Steinhauser, K. E., Orr, M., Lindquist, J. H., Grambouw, S. C., & Oddone, E. Z. (2004). Congestive heart failure patients' perceptions of quality of life: The integration of physical and psychological factors. *Aging Mental Health*, 8, 83-91.

Blackburn, C. (1991). Poverty and health: Working with families. Bristol: Open University Press.

Bradley, C. (1994). Translation of questionnaires for use in different languages and cultures. In C. Bradley (Ed.) *Handbook of psychology and diabetes*. Amsterdam: Harwood Academic Publishers.

Brauntwald, E. (2003). Application of current guidelines to the management of unstable angina and non-ST elevation myocardial infarction. *Circulation*, *108*(Supplement III), III-28-III-37.

British Psychological Society, The (2009). Code of Ethics and Conduct. Retrieved on September 26, 2009, from http://www.bps.org.uk/document-download-area/document-download$.cfm?file_uuid=E6917759-9799-434A-F313-9C35698E1864&ext=pdf.

Britton, A., Shipley, M., Marmot, M., & Hemingway, H. (2004). Does access to cardiac investigation and treatment contribute to social and ethnic differences in coronary heart disease? *British Medical Journal*, 329, 318.

Broadbent, E., Petrie, K. J., Main J., & Weinman, J. A. (2006). The Brief Illness Perception Questionnaire (BIPQ). *Journal of Psychosomatic Research*, *60*(6), 631-637.

Brockner, J., Paruchuri, S. Idson, L. C., & Higgins, E. T. (2002). Regulatory focus and the probability estimates of conjunctive and disjunctive events. *Organizational Behavior and Human Decision Processes*, *87*, 5-22.

Brodie, D. (Ed.) (2001). *Cardiac rehabilitation: An educational resource*. British Association for Cardiac Rehabilitation.

Brooks, R. (1996). EuroQoL: The current state of play. *Health Policy*, *37* (1), 53-72.

Bullinger, M., Alonso, J., Apolone, G., Leplege, A., Sullivan, M., Wood-Dauphinee, S., . . . Ware, J. E. (1998). Translating Health Status Questionnaires and Evaluating Their Quality: The IQOLA Project Approach. *Journal of Clinical Epidemiology*, *51*(11), 913-923.

Byrne, M., Walsh, J., & Murphy, A. W. (2005). Secondary prevention of coronary heart disease: Patients beliefs and health-related behaviour. *Journal of Psychosomatic Research*, *58*, 403-413.

Cameron, L. D., Booth, R. J., Schlatter, M., Ziginskas, D., Harman, J. E., & Benson, S. R. C. (2005c). Cognitive and affective determinants of decision to attend a group psychosocial support program for women with breast cancer. *Psychosomatic Medicine, 67*(4), 584-589.

Cameron, L. D., & Jago, L. (2008). Emotional regulation intervention: A common-sense model approach. *British Journal of Health Psychology*, *13*(2), 215-227.

Cameron, L., & Leventhal, H. (2003). Self-regulation, health, and illness: An overview. In L. Cameron & H. Leventhal (Eds.) *The Self-regulation of health and illness behaviour* (pp. 9-15). New York: Routledge.

Cameron, L. D., Petrie, K. J., Ellis, C. J., Buick, D., & Weinman, J. A. (2005a). Trait negative affective and responses to a health education intervention for myocardial infarction patients. *Psychology and Health, 20*(1), 1-18.

Cameron, L. D., Petrie, K. J., Ellis, C. J., Buick, D., & Weinman, J. A. (2005b). Symptom experiences, symptom attribution, and causal attributions in patients following first-time myocardial infarction. *International Journal of Behavioral Medicine, 12*(1), 30-38.

Canty, J. M. (2008). Coronary blood flow and myocardial ischaemia. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1167-1193). Philadelphia: Saunders Elsevier.

Carlisle, A. C. S., John A. M. S., Fife-schaw, S., & Mark, L. (2005). The self-regulatory model in women with rheumatoid arthritis: Relationship between illness perceptions, coping strategies, and illness outcome. *British Journal of Health Psychology*, *10*(4), 571-587.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4*, 92-100.

Carver, C. S., & Scheier, M. S. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*, *66*(1), 184-195.

Carver, C. S., Scheier, M. S., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267-283.

Cella, D. F., Lloyd, S. R., & Wright, B. D. (1996). Cross-cultural instrument equating: Current research and future directions. In B. Spilker (Ed.) *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 707-716). Philadelphia: Lippincot-Raven. Retrieved on August 12, 2009, from http://www.searo.who.int/LinkFiles/Regional_Tobacco_Surveillance_System_SentinelInd.

Centre for Health Research University of Indonesia (2001). Study of prevalence of tobacco use in Indonesia 2001.

Centers for Disease Control and Prevention (2009). Smoking & tobacco use: Bidis and kreteks. Retrieved on September 29, 2009, from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/bidis_kreteks/#effects

Central Disease Control (1990). The Surgeon General's 1990 report on the health benefits of smoking cessation. *Mortality and Morbidity Weekly Report*, *39*, 2-10.

Centre of Health Research Universitas Indonesia. (2007). Study of prevalence of tobacco use in Indonesia. Retrieved on September 27, 2009, from http://chr-ui.org//index.php?option=com_content&task=view&id=33

Charmaz, K. (2000). Experiencing chronic illness. In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.) *The handbook of social studies in health and medicine*. London: Sage Publications.

Cherrington, C. C., Moser, D. K., Lennie, T. A., & Kennedy, C. W. (2004). Illness representation after acute myocardial infarction: Impact on in-hospital recovery. *American Journal of Critical Care*, *13*(2), 136-145.

Cherrington, C. C., Moser, D. K., Lennie, T. A., & Kennedy, C. W. (2002). The physiological response in patients with acute myocardial infarction to the administration of psychological instruments. *Biological Research for Nursing*, *4*(2), 85-91.

Clark, K. K., Bormann, C. A., Cropanzo, R. S., & James, K. (1995). Validation evidence for three coping measures. *Journal of Personality Assessment, 65*(4), 435-455.

Clark, M. J. (1992). *Nursing in the Community*. Connecticut: Appleton & Lange.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *1*(3), 98-102.

Cohen, F. (1991). Measurement of coping. In A. Monat & R. S. Lazarus (Eds.) *Stress and coping: An anthology* (pp. 228-244). New York: Columbia University Press.

Coyne, J. C., & Gottlieb, B. H. (1996). The mismeasure of coping by checklist. *Journal of Personality*, *64*(4), 959-991.

Cooper, R. S. (2005). Coronary heart disease burden among persons of African origin. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 118-132). Oxford: Oxford University Press.

Cooper, A., Jackson, G., Weinman, J. A., & Horne, R. (2002). Factors associated with cardiac rehabilitation attendance: A systematic review of the literature. *Clinical Rehabilitation*, 16, 541-552.

Cooper, A., Lloyd, G., Weinman, J. A., & Jackson, G. (1999). Why patients do not attend cardiac rehabilitation: Role of intentions and illness beliefs. *Heart, 82*, 234-236.

Cooper, A., Weinman, J. A., Hankins, M., Jackson, G., & Horne, R. (2001). Assessing patients' beliefs about cardiac rehabilitation as a basis for predicting attendance after acute myocardial infarction. *Heart*, *93*(1), 53-58.

Craig, R. (2008). *Health Survey for England 2006*. National Centre *for* Social Research.

Croog, S., Shapiro, D. A., & Levine, S. (1971). Denial among male heart patients. *Psychosomatic Medicine*, *33*(5), 385-397.

Daly, J., Elliott, D., Cameron-Traub, E., Salamonson, Y., Davidson, P., & Jackson, D. (2000). Health status, perceptions of coping, and social support immediately after discharge of survivors of acute myocardial infarction. *American Journal of Critical Care, 9*, 62-69.

De Feyter, P. J . (2010). Catheter-based techniques to treat ischemic heart disease. In M. H. Crawford, J. P. DiMarco, & W. J. Paulus *Cardiology* (3rd ed). Philadelphia: Saunders Elsevier.

De Leon, C. F. M., & Meesters, C. M. G. (1991). Hostility and anger as risk factors of coronary heart disease. In A. Appels (Ed.) *Behavioral observations in cardiovascular research: Workshop on behavioral aspects of cardiovascular Disease*. Amserdam: Swets & Zeitlinger.

De Ridder, D., & De Witt, J. (2006). *Self-regulation in health behavior*. Chicester: John Wiley & Sons.

Department of Health (2004). *Health survey of England 2004: Health of ethnic minorities*. Retrieved on 25th March 2006, from www.dh.gov.uk.

Departemen Kesehatan RI, 20 Juta, Penderita Penyakit Jantung di Indonesia. (2004). Retrieved on July 7, 2006, from http://www.depkes.go.id/index.php?option= news&task=viewarticle&sid=639&Itemid=2

Dimsdale, J. E., & Hackett, T. P. (1982). Effect of denial on cardiac death and psychological assessment. *American Journal of Psychiatry*, 139, 1477-1480.

Dixon, T., Lynette, L., Lim, Y., & Oldridge, N. B. (2002). The MacNew heart disease health related quality of life instrument: Reference data for users. *Quality of Life Research, 11*, 173-183.

Druss, R. G., & Douglas, C. J. (1988). Adaptive responses to illness and disability. *General Hospital Psychiatry, 10*, 163-168.

Dyer, A. R., Stamler, J., & Greenland, P. (2005). Obesity. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease: From aetiology to public health* (2nd ed.) (pp. 291-310). Oxford: Oxford University Press.

Ellerhorst-Ryan, J. E. (1996). Instruments to measure spiritual status. In B. Spilker (1996) *Quality of life in pharmacoeconomics in clinical trials* (2nd ed.) (155-160). Philadelphia: Lippincott-Raven Publishers.

Epstein, F. H. (2005). Contributing of epidemiology to understanding coronary heart disease. In M. Marmot, & P. Elliot (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 8-17). Oxford: Oxford University Press.

Ezzatti, M., & Lopez, A. D. (2005). Coronary heart disease mortality attributable to smoking: Global and regional estimates for 2000. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 135-151). Oxford: Oxford University Press.

Fallowfield, L. (1991). *The quality of life: The missing measurement in health care* (Human Horizons Series). London: Souvenir Press.

Fayers, P. M., & Machin, D. (2001). *Quality of life: Assessment, analysis and interpretation*. Chichester: John Wiley & Sons.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage Publications.

Field, A., & Hole, G. (2003). *How to design and report experiments*. London: Sage Publications.

Figueras, M. J., & Weinman, J. A. (2003). Do similar patient and spouse perceptions of myocardial infarction predict recovery. *Psychology and Health*, *18*, 201-216.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in middle-aged community sample. *Journal of Health and Social Behavior*, *21*, 219-239.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, *48* (1), 150-170.

Folkman, S., & Lazarus, R. S. (1988). Coping as mediator of emotion. *Journal of Personality and Social Psychology*, *54* (3), 466-475.

Folkman, S., & Lazarus, R. S. (1991). Coping and emotion. In A. Monat & R. S. Lazarus (Eds.) *Stress and coping: An anthology* (pp. 207-227). New York: Columbia University Press.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. (1986). The dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, *50*, 992-1003.

Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology*, *50* (3), 571-579.

Forster, J., Grant, H., Idson, L. C., & Higgins, E. T. (2001). Success/failure feedback, expectancies, and approach/avoidance motivation: How regulatory focus moderates classic relations. *Journal of Experimental Social Psychology*, *37*, 253-260.

Freitas, A. L., Liberman, N., Salovey, P., & Higgins, E. T. (2002). When to begin?: Regulatory focus and initiating goal pursuit. *Personality and Psychological Bulletin*, *28*, 121-130.

Frostholm, L., Fink, P., Christensen, K. S., Toft, T., Oernboel, E., Olesen, F., & Weinman, J. A. (2005). The patients' illness perceptions and the use of primary health care. *Psychosomatic Medicine*, *67*, 997-1005.

Galziano, J. M. (2008). Fundamentals of cardiovascular disease. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1-20). Philadelphia: Saunders Elsevier.

Galziano, J. M., Manson, J. E., & Ridker, P. M. (2008). Primary and secondary prevention of coronary heart disease. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1119-1145). Philadelphia: Saunders Elsevier.

Garbett, R. (Ed.). (1998). Cardiology: Personal development. *Nursing Times*. London: Emap Healthcare.

Gentry, W. D., & Haney, T. (1975). Emotional and behavioral reaction to acute myocardial infarction. *Heart & Lung: The Journal of Acute and Critical Care, 4*, 738-745.

Gignac, M. A. M., & Gottlieb, B. H. (1996). Caregivers' appraisals of efficacy in coping with dementia. *Psychology and Aging*, *11* (2), 214-225.

Good, B. J., & Good, M-J. D. (1981). The meaning of symptoms: A cultural hermeneutic model for clinical practice. In A. Kleinman & L. Eisenberg (Eds) *Culture, illness, and healing 1: The relevance of social science for medicine*. Dordrecht: D. Reidel Publishing Co.

Gottlieb, B. H., & Gignac, M. A. M. (1996). Content and domain specificity of coping among family caregivers of persons with dementia. *Journal of Aging Studies*, *10* (2), 137-155.

Guarnaccia, P. J. (1996). Anthropological perspectives: The importance of culture in the assessments of quality of life. In B. Spilker (Ed.) *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 523-528). Philadelphia: Lippincot-Raven.

Guyatt, G., Jaeschke, R., Feeny, D., & Patrick, D. L. (1996). Measurements in clinical trials: Choosing the right approach. In B. Spilker (Ed.), *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 41-48). Philadelphia: Lippincot-Raven.

Haas, L. J., Leonard, J., & Galanti, G.-A. (2004). Cultural perspectives. In L. J. Haas (Ed.) *Handbook of primary care psychology*. Oxford: Oxford University Press.

Hackett, T. P. & Cassem, N. H. (1974). Development of a quantitative scale to assess denial. *Journal of Psychosomatic Research*, *18*(2), 93-100.

Hackett, T. P., Cassem, N. H., & Wishnie, H. A.(1968). The coronary-care unit. *New England of Medical Journal*, *279*, 1365-1370.

Hagan, J.W. (1991). Psychological adjustment following coronary artery graft bypass surgery. *Rehabilitation Counselling Bulletin, 35*, 97-104.

Hagger, M. S., Chatzisarantis, N. L. D., Griffin, M., & Thatcher, J. (2005). Injury representations, coping, emotions, and functional outcomes in athletes with sports-related injuries: A test of self-regulation theory. *Journal of Applied Social Psychology, 35*, 2345-2374.

Hagger, M. S. & Orbell, S. (2003). A meta-analytic review of common-sense model of illness representations. *Psychology and Health*, *18*(2), 141-194.

Hall, M. (2004). *Target: Heart disease*. London: Association of British Pharmaceuticals Industry.

Hanusz, M. (2002). *Kretek: the culture and heritage of Indonesia's clove cigarettes*. Jakarta: Equinox Publishing.

Harding, S., Rosato, M., & Teyhan, A. (2008). Trends for coronary heart disease and stroke mortality among migrants in England and Wales, 1979-2003: slow declines notable for some groups. *Heart*, *94*, 463-470.

Hartung, P. J., & Penn, M. A. (2004). Work stress and health. In S. Sutton, A. Baum, & M. Johnston (Eds.) *The SAGE handbook of health psychology*. London: SAGE Publications.

Heijmans, M. (1999). The role of patients' illness representations in coping and functioning with Addison's disease. *British Journal of Health Psychology*, *4*, 137-149.

Helman, C. G. (2007). *Culture, health and illness* (5th ed.). Bath: Butterworth-Heineman.

Henley, A., & Schott, J. (1999). *Culture, religion and patient care in a multi-ethnic society: A handbook for professionals*. London: Age Concern England.

Higgins, E.T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology*, *72*, 515-525.

Higgins, E.T. (1997). Beyond pleasure and pain. *The American Psychologist*, *52*, 1280-1300.

Hillier, S., & Kelleher, D. (1996). Considering culture, ethnicity and the policies of health. In D. Kelleher and S. Hillier (Eds.), *Researching cultural differences in health* (2nd ed.) (pp. 1-10). London: Routledge.

Hillier, S. & Rahman, S. (1996). Childhood development and behavioural and emotional problems as perceived by Bangladeshi parents in East London. In D. Kelleher and S. Hillier (Eds.), *Researching cultural differences in health* (2nd ed.) (pp. 38-68). London: Routledge.

Hintsanen, M., Kivimaki, M., Elovainio, M., Pulkki-Raback, L., Keskivaara, P., Juonala, M., . . . Keltikangas-Järvinen, L.(2005). Job strain and early atherosclerosis: The cardiovascular risk in young Finns study. *Psychosomatic Medicine*, *67*, 740-747.

Hirani, S. P., Pugsley, W. B., & Newman, S. P. (2006). Illness representations of coronary artery disease: An empirical examination of the Illness Perceptions Questionnaire in patients undergoing surgery, angioplasty, and medication. *British Journal of Health Psychology, 11*, 199-220.

His, Y. Y., Chen, C. Y., & Lee, M. B. (1990). Life quality post myocardial infarction patients: Influence of personal variables on coping. *Journal Formos Med Association, 89*, 149-155.

Hlatky, M. A. & Mark, D. B. (2008). Economics and cardiovascular disease. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 35-40). Philadelphia: Saunders Elsevier.

Höfer, S., Lim, L., Guyatt, G., & Oldridge, N. (2004). The MacNew heart disease quality of life instrument: A summary. *Health and Quality of Life Outcomes, 2* (3). Retrieved on April 6, 2006, from http://www/hqlo.com/2/1/3/. Doi:10.1186/1477-7525-2-3.

Howitt, D., & Cramer, D. (2008). *Introduction to SPSS in psychology* (4th ed.). Harlow: Pearson Prentice Hall.

Hunt, S.M., McKenna, S.P., McEwen, J., Williams, J., & Papp, E. (1981). The Nottingham Health Profile: Subjective health status an medical consultations. *Social Science and Medicine, Part A: Medical Sociology*, 15 (3), 221-229.

Imperial College Healthcare NHS Trust (2009). Cardiology. Retrieved on September 26, 2009, from http://www.imperial.nhs.uk/hammersmith/ourservices/cardiology/index.htm

Illness Perception Questionnaire, The, Retrieved March 31, 2007, from http://www.uib.no/ipq/

Jackson, T., Mackenzie, J., & Hobfoll, S. E. (2000). Communal aspects of self-regulation. In M. Boekarts, P. R. Pintrich, & M. Zeidner (Eds.) *Handbook of self-regulation* (2nd ed.). California: Academic Press.

Jakarta Post, The., (2009). *Jakarta traffic gridlock: The malady of 'macet'*. Retrieved on August 03, 2009, from http://www.thejakartapost.com/news/2009/06/24/jakarta039s-traffic-gridlock-the-malady-macet039.html

Janis, I. L. (1983). Preventing pathogenic denial by means of stress innoculation. In S. Breznitz (Ed.) *The denial of stress*. New York: International Universities Press, Inc.

Janoff-Bulman, R. (1985). Victimization: Rebuilding shattered assumptions. In C. R. Figley (Ed.) *Trauma and its wake vol. 1: The study and treatment of post-traumatic stress disorder* (pp. 15-35). Bristol: Brunner/Mazel.

Janoff-Bulman, R. (1979). Characterological versus behavioral self-blame: Inquiries into depression and rape. *Journal of Personality and Social Psychology*, *37*, *1798-1809*.

Jenkins, C. D., Zyzanski, S. J., Rosenman, R. H., & Cleveland, G. L. (1971). Association of coronary-prone behavior scores with recurrence of coronary heart disease. *Journal of Chronic Disease*, *24*, 601-611.

Johnson, M. R. D., Owen, D., & Blackburn, C. (2000). *Black and minority ethnic groups in England: The second health and lifestyles survey*. London: Health Education Authority.

Johnson, T. M. (1996). Cultural considerations. In B. Spilker (Ed.), *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 511-516). Philadelphia: Lippincot-Raven Publishers.

Joint Health Survey Unit. (2008). *Health survey for England 2006: Cardiovascular disease and risk factors*. Leeds: The Information Centre.

Jolliffe, J. A., Rees, K., Taylor, R. S., Thompson, D., Oldridge N., & Ebrahim, S. (2006). Exercise-based rehabilitation for coronary heart disease (Review). *The Cochrane of Systematic Reviews*. 2001. Issue 1. Art. No.: CD001800. DOI: 10.1002/14651858.CD001800.

Julian, D. G., & Cowan, J. C. (Eds.) (2005). *Cardiology* (8th ed). London: Baillière Tindall.

Juniper, E. F., Guyatt, G. H., & Jaeschke, R. (1996). How to develop and validate a new health-related quality of life instrument. In B. Spilker (Ed.), *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 49-52). Philadelphia: Lippincot-Raven.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24* (2), 285-308

Karasek, R. A., Baker, D., Marxer, F., Ahlbom, A., & Theorell, T. (1981). Job decision latitude, job demands, and cardiovascular disease: A prospective study of Swedish men. *American Journal of Public Health*, *71* (7), 694-705.

Karasek, R. A., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, *3* (4), 322-355.

Karasek, R. A., Theorell, T., Schwartz, J. E., Schnall, P. L., Pieper, C. F., & Michela, J. L. (1988). Job characteristics in relation to the prevalence of myocardial infarction in the US Health Examination Survey (HES) and the Health Nutrition Examination Survey (HANES). *American Journal of Public Health*, *78* (8), 910-918.

Kelleher, D. (1996). A defence on the use of the terms 'ethnicity' and 'culture'. In D. Kelleher, & S. Hillier (Eds.) *Researching cultural differences in health*. London: Routledge.

Keltikangas-Järvinen, L., & Räikkönen, K. (1990). Type A factors as predictors of somatic risk factors of coronary heart disease in young Finns-A six-year follow-up study. *Journal of Psychosomatic Research*, *34* (1), 89-97.

Kirshner, B., & Guyatt, G. (1985). A methodological framework for assessing health indices. *Journal of Chronic Disease*, *38* (1), 27-36.

Kleinman, A. (1981). *Patients and healers in the context of culture: An exploration of the borderland between anthropology, medicine, and psychiatry*. California: University of California Press.

Kristofferzon, M.-L., Löfmark, R., & Carlsson, M. (2005). Myocardial infarction: gender differences in coping and social support. *Journal of Advanced Nursing*, *44* (4), 360-374.

Kristofferzon, M.-L., Löfmark, R., & Carlsson, M. (2003a). Coping, social support and quality of life over time after myocardial infarction. *Journal of Advanced Nursing*, *52* (2), 113-124.

Kristofferzon, M.-L., Löfmark, R., & Carlsson, M. (2003b). Perceived coping, social support, and quality of life 1 month after myocardial infarction: A comparison between Swedish women and men. *Heart & Lung: The Journal of Acute and Critical Care*, *34* (1), 39-50.

Kuper, H., Marmot, M., & Hemingway, H. (2005). Systematic review of prospective cohort studies. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease: From aetiology to public health* (2nd ed.). Oxford: Oxford University Press.

Lachar, B. (1993). Coronary-prone behavior. *Texas Heart Institute Journal*, *20*, 143-151.

Lambert, H., & Sevak, L. (1996). Is 'cultural difference' a useful concept? In D. Kelleher and S. Hillier, *Researching cultural differences in health* (pp. 124-159). London: Routledge.

Landrine, H., & Klonoff, E.A. (1994). Cultural diversity in causal attributions for illness: The role of supernatural. *Journal of behavioral medicine*, *17*(2), 181-193.

Lane, D., Caroll, D. Ring, C., Beevers, D. G., & Lip, G.Y. (2001). Predictors of attendance of cardiac rehabilitation after myocardial infarction. *Journal of Psychosomatic Research*, *51* (3), 497-501.

Lane, G. E., & Holmes, Jr., D. R. (2008). Primary percutaneous coronary intervention in the management of acute myocardial infarction. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicin*e (8th ed.) (pp. 1301-1314). Philadelphia: Saunders Elsevier.

Lane, S. D., & Cibula, D. A. (2000). Gender and health. In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.) *The handbook of social studies in health and medicine*. London: Sage Publications.

Lau, R. R., Bernard, T. M., & Hartman, K. A. (1989). Further explorations of common-sense representations of common illnesses. *Health Psychology*, *8* (2), 195-219.

Lau, R. R., & Hartman, K. A. (1983). Common sense representations of common illnesses. *Health Psychology*, *8* (2), 167-185.

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. London: Free Association Books.

Lazarus, R. S. (1983). The cost and benefit of denial. In S. Breznitz (Ed.) *The denial of stress*. New York: Academic Universities Press.

Lazarus, R. S., & Folkman, S. (1991). The concept of coping. In A. Monat, & R. S. Lazarus (Eds.) *Stress and coping: An anthology* (pp.189-206). New York: Columbia University Press.

Leão, T., Sundquist, J., Johansson, S-E., & Sundquist, K. (2009). The influence of age at migration and length of residence on self-rated health among Swedish immigrants: A cross-sectional study. *Ethnicity & Health*, *14* (1), 93-105.

Leslie, F., Waid, L., & Fincke, C. (2002). Coping with anxiety in later life. *Journal of Gerontological Nursing*, *28* (12), 40-47.

Levenson, J. L., Mishra, A., Hamer, R. M., & Hastillo, A. (1989). Denial and medical outcome in unstable angina. *Psychosomatic Medicine*, *51*, 27-35.

Leventhal, H., & Johnson, J. E. (1983). Laboratory and field experimentation: development of a theory of self-regulation. In P. J. Woolridge, M. H. Schmitt, J. K. Skipper, & R. C. Leonard (Eds.) *Behavioral science and nursing theory* (pp. 189-262). St Louis: The C.V. Mosby Company.

Leventhal, H., Leventhal, E., & Contrada, R. J. (1998). Self-regulation, health, and behaviour: A perceptual-cognitive approach. *Psychology & Health*, *13*, 717-733.

Leventhal, H., Meyer, D., & Nerenz, D. (1980). The common-sense model of illness danger. In S. Rachman (Ed.) *Medical psychology: Vol. 2* (pp 7-30). New York: Pergamon.

Leventhal, H., & Nerenz, D. (1985). The assessment of illness cognition. In P. Karoly, & M. P. Jensen (Eds.) *Multimethod assessment of chronic pain*. New York: Pergamon.

Levine, J., Warrenburg, S., Kerns, R., Schwartz, G., Delaney, R., Fontana, A., Cascione, R. (1987). The role of denial in recovery from coronary heart disease. *Psychosomatic Medicine, 49*(2), 109-117.

Lewis, G. (1981). Cultural influences on illness behavior: A medical anthropological approach. In A. Kleinman & L. Eisenberg (Eds.) *Culture, illness, and healing 1: The relevance of social science for medicine (Vol. 1)*. Dordrecht: D. Reidel Publishing.

Lewis, M. (2008). Self-conscious emotions: Embarassment, pride, shame, and guilt. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.) *Hand book of emotions* (pp. 742-756). New York: The Guildford Place.

Liberman, N., Molden, D. C., Idson, L. C., & Higgins, E. T. (2001). Promotion and prevention focus on alternative hypotheses: Implications for attributional functions. *Journal of Personality and Social Psychology*, *80*, 5-18.

Lockwood, P., Marshall, T. C., & Sneller, P. (2005). Promoting success or preventing failure: Cultural differences in motivating by positive and negative role model. *Personality and Social Psychology Bulletin*, *31*, 379-392.

Lowe, M., Schofield, P. M., & Grace, A. A. (1993). *Cardiology colour guide*. London: Churchill Livingstone.

Lowe, R., Norman, P., & Bennett, P. (2000). Coping, emotion and perceived health following myocardial infarction: Concurrent and predictive associations. *British Journal of Health Psyschology*, *5*, 337-350

Mæland, J. G., & Havik, O. E. (1987). Psychological predictors for return to work after myocardial infarction. *Journal of Psychosomatic Research*, *31*, 471-481.

Mackay, J., & Mensah, G. A. (2004). *Atlas of heart disease and stroke*. World Health Organization.

McCrae, R. R., & Costa, P. T. (1986). Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality*, 54(2), 385-405.

Madhok, R., Bhopal, R. S., & Rumaiah, R. S. (1992). Quality of hospital service: A study of comparing 'Asian' and 'non-Asian' patients in Middlesborough. *Journal of Public Health*, *14*(3), 271-279.

Mak, K. -H., Chia, K. -S., Kark, J. D., Chua, T. Foong, B. –H., Lim, Y. –L., & Chew, S. –K. (2003). Ethnic differences in acute myocardial infarction in Singapore. European Heart Journal, 24(2), 151-160. doi:10.1016/so195-668X(02)00423-2

Maniu, C. V., Flipse, T. R., Patton, J. N. & Gerald Fletcher (2010). Physical activity and the cardiovascular system. In M. H. Crawford, J. P. DiMarco, & W. J. Paulus (Eds.) *Cardiology* (3rd ed). Philadelphia: Saunders Elsevier.

Marenburg, M .E.,Risch, N., Berkman, L. F., Floderus, B., & de Faire, U. (1995). Genetic susceptibility to death from coronary artery disease in a study of twins. *The New England Medical Journal*, 330(15), 1041-1046.

Marmot, M., Adleson, A., & Bulusu, L. (1984). Lessons from the study of immigrant mortality. *Lancet*, 30 (1), 1455-1457.

Marmot, M., & Elliott, P. (2005). Coronary heart disease epidemiology: From aetiology to public health. In M. Marmot, & P. Elliot (Eds.) *Coronary heart disease epidemiology: From aetiology and public health* (2nd ed.) (pp. 3-7). Oxford: Oxford University Press.

Marmot, M., & Syme, S. L. (1976). Acculturation and coronary heart disease in Japanese-Americans. *American Journal of Epidemiology*, *104*(3), 225-247.

Marmot, M., Syme, S. L., Kagan, A., Kato, H., Cohen, J. B., & Belsky, J. (1975). Epidemiology studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: Prevalence of coronary heart disease and associated risk factors. *American Journal of Epidemiology, 102*(6), 514-525.

Maslach, C., & Jackson, S. E. (1984). Burnout in organizational settings. In S. Oskamp (Ed.), *Applied Social Psychology Annual* (Vol. 5). California: Sage.

Mazrui, A. A. (1986). *The Africans: A Triple Heritage*. Boston: Little, Brown.

Mieres, J. H., Kelsey, S. F., & Ofili, E. (2004). Special consideration for minority women. In L. J. Shaw & R. F. Redberg (Eds.) *Coronary disease in women: Evidence-based diagnosis and treatment*. New Jersey: Humana Press.

Miller, A. K. & Markman, K. D. (2007). Depression, regulatory focus, and motivation. *Personality and Individual Differences*, *43*, 427-436

Mischel, W., Cantor, N., & Feldman, S. (1996). Principles of self-regulation: The nature of willpower and self-control. In E. T. Higgins, & A. W. Kruglanski (Eds) *Social psychology: Handbook of principles*. New York: Guildford.

Moberg, D. O. (1979). The development of social indicators for quality of life research. *Sociology of religion*, *40*(1), 11-26

Mohamad, K. (2009, June 27). Perang rokok RI-AS. *Kompas*, *p.1*.

Marenberg, M. E., Risch, N., Berkman, L. F., Floderus, B. & de Faire, U. (1994). Genetic susceptibility to death from coronary heart disease in a study of twins. *New England Medical Journal*, 330, 1041-1046.

Morrison, V., & Bennett, P. (2006). *An introduction to health psychology*. Essex: Prentice-Hall.

Moss-Morris, R., Petrie, K. J., & Weinman, J. A. (1996). Functioning in chronic fatigue syndrome: Do illness perceptions play a regulatory role? *British Journal of Health Psychology*, *1*, 15-25.

Moss-Morris, R., Weinman, J. A., Petrie, K. J., Horne, R. Cameron, L. D., & Buick, D. (2002). The revised illness perception questionnaire (IPQ-R). *Psychology and Health*, *17*, 1-16.

Motulsky, A. G. (1992). The role of genetics as a risk factor in cardiovascular disease. In A. M. Gotto, C. Lenfant, R. Paoletti, & M. Soma (Eds.), *Multiple risk factor in cardiovascular disease*. Dordrecht: Kluwer Academic Publishers.

Mullen, B., & Suls, J. (1982). The effectiveness of attention and rejection as coping styles: A meta-analysis of temporal differences. *Journal of Psychosomatic Research*, *26*(1), 43-49.

Nazroo, J.Y . (1997). *The health of Britain's ethnic minorities*. London: Policy Studies Institute.

Nichter, M. (1996). Pharmaceuticals, the commodification of health and the health care-medicine use transition. In M. Nichter & M. Nichter (Eds) *Anthropology and international health: Asian case studies*. Amsterdam: Gordon and Breach Publishers.

Office for National Statistics (2007). General Household Survey. Retrieved on September 26, 2009, from http://www.statistics.gov.uk/downloads/theme_compendia/GHS07/GHSSmokingandDrinkingAmongAdults2007.pdf

Office for National Statistics (2005). The National Statistics Socio-economic Clasification: User manual. Retrieved on September 20, 2009, from http://www.statistics.gov.uk/methods_quality/ns_sec/downloads/NS-SEC_User_2005.pdf

Oldridge, N., Guyatt, G., Jones, N., Crowe, J., Singer, J., Feeny, D., . . . Torrance, G. (1991). Effects on quality of life with comprehensive rehabilitation after acute myocardial infarction. *The American Journal of Cardiology*, *67*, 1084-1089.

Orth-Gomèr, K. Weidner, G., Anderson, D. E., & Chesney, M. A. (2010). Psychosocial influences of the heart. In M. H. Crawford, J. P. DiMarco, & W. J. Paulus (Eds.). *Cardiology* (3rd ed). Philadelphia: Saunders Elsevier.

Petersen, O. Veto, V., & Rayner, M. (2004). *2004 Coronary Heart Disease Statistics*. London: British Heart Foundation.

Petrie, K. J., Weinman, J.A., Sharpe, N., & Buckley, J. (1996). Role of patient's view of their illness in predicting return to work and functioning after myocardial infarction: Longitudinal study. *British Medical Journal*, *312*, 1191-1194.

Petrie, K. J., Cameron, L. D., Ellis, C. J., Buick, D., & Weinman, J. A. (2002). Changing illness perceptions after myocardial infarction: An early intervention randomized controlled trial. *Psychosomatic Medicine, 64*, 580-586.

Pitula, C. R., Burg, M. M., & Froelicher, E. S. (1999). Psychosocial risk factors: Assessment and intervention for social isolation. In N. K. Wenger, L. K. Smith, E. S. Froelicher & P. M. Comoss (Eds.) *Cardiac rehabilitation: A guide to practice in the 21st century* (pp. 279-286). New York: Marcel & Dekker, Inc.

Prohaska, T. R., Leventhal, E. A., Leventhal, H., & Keller, M. L. (1985). Health practices and illness *cognition* in young, middle age and elderly adults. *Journal of Gerontology*, *40*, 569-578.

Pudaric, S., Sundquist, J., & Johansson, S-E. (2000). Major risk factors for cardiovascular disease in elderly migrants in Sweden. *Ethnicity & Health*, *5* (2), 137-150.

Radelet, S., & Sachs, J. D. (1998). The East Asian financial crisis: diagnosis, remedies, prospects. *Brooking papers on economic activities*, 1, 1-90.

Rasmussen, H. N., Wrosch, C., Scheier, M. F., & Carver, C. S. (2006). Self-regulation processes and health: The importance of optimism and goal adjustment. *Journal of Personality*, 74(6), 1721-1747.

Reddy, K. S. (2005). Developing countries. In M. Marmot & P. Elliott (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 113-117). Oxford: Oxford University Press.

Rippetoe, P. A., & Rogers, R. W. (1987). Effects of components of protection-motivation theory on adaptive and maladaptive coping with health threat. *Journal of Personality and Social Psychology*, *52*, 596-604.

Robert, S. A., & House, J. S. (2000). In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.) *The handbook of social studies in health and medicine*. London: Sage Publications.

Rogers, R. W., & Deckner, C.W. (1975). Effects of fear appeals and physiological arousal upon emotion, attitudes, and cigarette smoking. *Journal of Personality and Social Psychology*, *32*, 222-230.

Rosenman, R. H., & Friedman, M. (1959). The possible relationship of occupational stress to clinical coronary heart disease. *California Medicine*, *89* (3), 169-174.

Rosenman, R. H., Friedman, M., Straus, R., Jenkins, C. D., Zyzanski, S. J., & Wurm, M. (1970). Coronary heart disease in the western collaborative group study. *Journal of Chronic Disease*, *23*, 173-190.

Ruiter, R. A. C., Verplanken, B., Kok, G., & Werrij, M. Q. (2003a). The role of coping appraisal in reactions to fear appeals: Do we need threat information? *Journal of Health Psychology*, *8*, 465-474.

Ruiter, R. A. C., Abraham, C., & Van Eersel, G. (2003b). Strengthening the persuasive impact of fear appeals: The role of action framing. *The Journal of Social Psychology*, *143*, 397-400.

Ruiter, R.A.C., Kessels, L., Jansma, B.M., & Brug, J. (2006). Increased attention for computer-tailored health communications: An event-related potential study. *Health Psychology*, *25*, 300-306.

Ruiter, R. A. C., Kok, G., Verplanken, B., & Brug, J. (2001). Evoked fear and effects of appeals on attitudes to performing breast self-examination: An information-processing perspective. *Health Education Research*, *16*, 307-319.

Rutter, C. L., & Rutter, D. R. (2002). Illness representation, coping, and outcome in irritable bowel syndrome. *Journal of Health Psychology*, *7*(4), 377-391.

Saab, M. (2005). Thrombolysis versus PCI: Can cardiologists have their cake and eat it? *Cardiology News*, *8*(2), 6-9.

Sapolsky, R. M. (2004). *Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping* (3rd edition). New York: Henry Holt and Company.

Sanderson, B., Phillips, M., Gerald, L., DiLillo, V., & Bittner, V. (2003). Factors associated with the failure of patients to complete cardiac rehabilitation for medical and non-medical reasons. *Journal of Cardiopulmonary Rehabilitation*, *23*(4), 281-289.

Scharloo, M., van Velzen-Verkaik, E., Doom op den Akker, M. M., Baatenbuurg de Jong, R. J., Langeveld, T. P. M., & Kaptein, A. A. (2005). Quality of life and illness perception in patients with recently diagnosed with head and neck cancer. *Head & Neck, 27*(10), 857-863.

Scharloo, M., Kaptein, A. A., Weinman, J. A., Hazens, J., Willem, L. N. A., Bergman, W., & Rooijmans, H. G. M. (1998). Illness perceptions, coping, and functioning in patients with rheumatoid arthritis, chronic pulmonary disease, and psoriasis. *Journal of Psychosomatic Research, 44*(5), 573-585.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247.

Schipper, H., Clinch, J. J., & Olweny, L. M. (1996). Quality of life studies: Definitions and conceptual issues. In B. Spilker (Ed.) *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 11-24). Philadelphia: Lippincot-Raven Publishers.

Schnall, P. L., Schwartz, J. E., Landsbergis, P. A., Warren, K., & Pickering, T. G. (1998). A longitudinal study of job strain and ambulatory blood pressure: Results from a three-year follow-up. *Psychosomatic Medicine, 60*, 697-706.

Schwartz, J. B., & Zipes, D. P. (2008). Cardiovascular disease in the elderly. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 1923-1952). Philadelphia: Saunders Elsevier.

Schwarzer, R., & Schwarzer, C. (1996). A critical survey of coping instruments. In M. Zeidner (Ed.) *Handbook of coping*. Toronto: John Wiley and Sons.

Searle, A., Norman, P., Thompson, R., & Vedhara, K. (2007). A prospective examination of illness beliefs and coping in patients with type 2 diabetes. *British Journal of Health Psychology*, *12*(4), 621-638.

Senior, M., & Viveash, B. (1998). *Health and illness*. London: Macmillan Press.

Shafey, O., Eriksen, M., Ross, H., & MacKay, J. (2009). The tobacco atlas (3rd edition). Retrieved on September 26, 2009, from http://www.cancer.org/downloads/AA/TobaccoAtlas07.pdf

Shah, A. S., Bhopal, R., Gadd, S., & Donohoe, G.R. (2010). Out of hospital cardiac arrest in South Asian and white populations in London: Database evaluation of characteristics and outcome. *Heart*, 96, 27-29.

Shaw, R. E., Cohen, F., Doyle, B., & Palesky, J. (1985). The impact of denial and repressive style on information gain and rehabilitation outcomes in myocardial infarction patients. *Psychosomatic Medicine, 47*(3), 262-273.

Shen, B., McCreary, C. P., & Myers, H. F. (2004). Independent and mediated contributions of personality, coping, social support, and depressive symptoms to physical functioning outcome among patients in cardiac rehabilitation. *Journal of Behavioral Medicine*, *27*(1), 39-62.

Smith, C. A. & Lazarus, R. S. (1993). Appraisal components, core relational themes and the emotions. *Cognition and Emotions*, *7*, 233-296.

Spertus, J. A., Winder, J. A., Dewhurst, T. A., Prodzinski, J., McDonnell, M., & Fihn, S. D. (1995). Development and evaluation of the Seattle Angina Questionnaire:A new functional status measure for coronary artery disease. *Journal of the*

American College of Cardiology, *25*(2), 333-341. doi: 10.1016/0735-1097(94)00397-9.

Stamler, J. (2005). Established major risk factors: historical overview. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 18-31). Oxford: Oxford University Press.

Spertus, J. A., Winder, J. A., Dewhurst, T. A., Deyo, R. A., Prodzinski, J., McDonnell, M., & Fihn, S. D. (1995). Development and evaluation of the Seattle Angina Questionnaire: A new functional status measure for coronary artery disease. *Journal of American College of Cardiology*, *25*(2), 333-341

Stamler, J., Neaton, J. D., Garside, D. B., & Daviglus, M. L. (2005). Current status: Six established major risk factors - and low risk. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease: From aetiology to public health* (2nd ed.). Oxford: Oxford University Press.

Stevens, P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). (2009). Routledge Academic.

Stubbs, P. (1994). 'Ethnically sensitive' or 'anti-racist'? Models for health research and service delivery. In W. I. U. Ahmad (Ed.) *'Race' and health in contemporary Britain*. Buckingham: Open University Press.

Sugano, D. S., & McElwee, N. E. (1996). An epidemiologic perspective. In B. Spilker (Ed.) *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp.555-563). Philadelphia: Lippincott-Raven Publishers.

Suzuki, S. (1999). Health of rural and urban communities in developing countries: A case study of Indonesia. In M. Honari, & T. Boleyn (Eds.) *Health ecology: Health, culture and human-environment interaction*. London: Routledge.

Swanton, R. H. (2003). *Pocket consultant: Cardiology* (5th ed.). Cornwall: Wiley-Blackwell.

Swenson, J. R., & Clinch, J. J. (2000). Assessment of quality of life in patients with cardiac disease: The role of psychosomatic medicine. *Journal of Psychosomatic Research, 48*, 405-415.

Syme, S. L., Marmot, M., Kagan, A., Kato, H., & Rhoads, G. G. (1975). Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: Introduction. *American Journal of Epidemiology, 102*(6), 477-480.

Tan, L. B., & Ball, S. G. (1994). *ACE inhibition after myocardial infarction*. London: Science Press.

Tangney, J. P. (1995). Recent advances in the empirical study of shame and guilt. *American Behavioral Scientist*, *38*(8), 1132-1145.

Timmis, A. D., Nathan, A. W., & Sullivan, I. D. (1997). *Essential cardiology* (3rd edition). London: Blackwell Publishers.

Townsend, P., & Davidson, P. (1992). The black report. In P. Townsend, & P. Davidson (Eds.) *Inequalities in health* (2nd ed.) (pp. 31-213). London: Penguin Books.

Ueshima, H. (2005). Trends in Asia. In M. Marmot, & P. Elliott (Eds.) *Coronary heart disease epidemiology: From aetiology to public health* (2nd ed.) (pp. 102-112). Oxford: Oxford University Press.

Unal, B. Critchley, J. A., & Capewell, S. (2004). Explaining the decline in coronary heart disease mortality in England and Wales between 1981 and 2000. *Circulation*, *109*(9), 1101-1107.

Valenti, L., Lim, L., Heller, R. F., & Knapp, J. (1996). An improved questionnaire for assessing quality of life after acute myocardial infarction. *Quality of Life Research, 5*(1), 151-161.

Van Elderen, T., Maes, S., & Dusseldorp, E. (1999). Coping with coronary heart disease: A longitudinal study. *Journal of Psychosomatic Research, 47*(2), 175-183.

Wahl, A., Moum, B. R., Hanestad, I., & Kalfoss, M. H. (1999). Adapting the Jalowiec coping scale in Norwegian adult psoriasis patients. *Quality of Life Research, 8*, 435-445.

Wailoo, A., Goodacre, S., Sampson, F., Alava M.H., Asseburg, C., Palmer, S. … Gray, H. (2010). Primary angioplasty versus thrombolysis for acute ST-elevation myocardial infarction: an economic analysis of the National Infarct Angioplasty Project. *Heart*, 96, 668-672.

Walsh, M. (2003). *Watson's clinical nursing & related sciences* (5th ed.). London: Ballière Tindall, in association with Royal College of Nursing.

Waters, D. D. (2010a). Risk factors for cardiovascular disease. In M. H. Crawford, J. P. DiMarco, & W. J. Paulus (Eds.) *Cardiology* (3rd ed). Philadelphia: Saunders Elsevier.

Waters, D. D. (2010b). Special problems in the prevention of cardiovascular disease: Nontraditional risk factors for coronary disease. In M. H. Crawford, J. P.

DiMarco, & W. J. Paulus (Eds). *Cardiology* (3rd ed). Philadelphia: Saunders Elsevier.

Ware, J. E., Gandek, B.L., Keller, S.D., & the IQOLA Project Group. (1996). Evaluating Instruments Used Cross-Nationally: Methods from the IQOLA Project. In B. Spilker (Ed.) *Quality of life and pharmacoeconomics in clinical trials* (2nd ed.) (pp. 681-693). Philadelphia: Lippincott-Raven Publishers.

Webb, S., & Permatasari, S. (2005). Altria to boost output of Indonesia's high tar clove cigarettes. Retrieved on September 29, 2009, from http://www.bloomberg.com/apps/news?pid=10000103&sid=aJiTUHE6JaPA&refer=us.

Wenger, N. K., & Smith, L. K. (1999) Benefits of exercise training. In N. K . Wenger, L. K. Smith, E. S. Froelicher, & P. M. Cormoss (Eds.) *Cardiac rehabilitation in the 21st century* (pp. 9-18). New York: Marcel Dekker, Inc.

Wenger, N.K., Naughton, M. J., & Furberg, C. D. (1998). Cardiovascular disorder. In J.A. Cramer, & B. Spilker (Eds.) *Quality of life in pharcoeconomics in clinical trials: An Introduction* (2nd ed.) (pp. 883-892). Lippincott William and Wilkins.

Weinman, J.A., & Petrie, K.J. (1997). Illness perceptions: A new paradigm for psychosomatics? *Journal of Psychosomatics Research, 42*, 113-116.

Whitehead, M. (1992). The health divide. In P. Townsend, & P. Davidson (Eds.) *Inequalities in health* (2nd ed.) (pp. 217-356). London: Penguin Books.

Whitmarsh, A. Koutmatji, M., & Sidell, K. (2003). Illness perceptions, mood and coping in predicting attendance at cardiac rehabilitation. *British Journal of Health Psychology*, *8*, 209-221.

Wild, S. & McKeigue, P. (1997). Cross-sectional analysis of mortality by country of birth in England and Wales, 1970-1992. *British Medical Journal*, *314*, 705.

Wild, S., Roglic, C., Green, A., Sicree, R. & King, H. (2004). Global prevalence of diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care*, *27*, 1047-1053.

Williams, R. (1993). Religion and illness. In A. Radley (Ed.) *Worlds of illness: Biographical and cultural perspectives on health and disease* (pp. 71-92). London: Routledge.

Wilkinson, R., & Marmot, M. (2006). *Social determinants of health* (2nd ed.). Oxford: Oxford University Press.

Witt, B. J., & Roger, V. L. (2004). Population-based sex differences in disease incidence and prevalence. In L. J. Shaw, & R. F. Redberg (Eds.) *Coronary heart disease in women: Evidence-based diagnosis and treatment*. New Jersey: Humana Press.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, *59*, 329-349.

Witteberg, S. H., Blanchard, E. B., Suls, J., Tennen, H., McCoy, G. & McGoldrick, M. D. (1983). Perceptions of control and causality as predictors of compliance and coping in hemodialisis. *Basic and applied social psychology*, *4*(4), 319-336.

WHO (2008a). *WHO report on the global tobacco epidemic*. Retrieved from http://www.who.int/mpower/, 15th September 2009.

WHO (2008b). *WHO statistics*. Retrieved from http://www.who.int/countries/, 29th June 2010.

WHO (2006). *Tobacco: Deadly in any form or disguise*. Retrieved on September 29, 2009, from http://www.who.int/tobacco/communications/events/wntd/2006/Report_V8_4May06.pdf

WHO (2002). *Mortality country fact sheet 2006*. Retrieved on May 27, 2009, from http://www.who.int/whosis/mort/profiles/mort_searo_idn_indonesia.pdf.

Woo, K. S., Yip, T., Kwong, S. K., Chook, P., & Kum, L. (2005). Commentary: Smoking and atherosclerotic diseases in Asia – the implication in global atherosclerosis prevention. *International Journal of Epidemiology*, *34*, 1045-1056.

Woodward, M., Barzi, F., Martiniuk, A., Fang, X., Gu, D. F., Imai, Y., … Huxley, R. (2006). Cohort profile: the Asia Pacific Cohort Studies Collaboration. *International Journal of Epidemiology*, *35*, 1412-1416.

Worth, R. M., Kato, H., Rhoads, G. G., Kagan, A., & Syme, S. L. (1975). Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: Mortality. *American Journal of Epidemiology, 102*(6), 481-490.

Wulsin, L. R. & Barsky, A. J. (2008). Psychiatric and behavioral aspects of cardiovascular disease. In P. Libby, R. O. Bonow, D. L. Mann, & D. P. Zipes (Eds.) *Braunwald's heart disease: A textbook of cardiovascular medicine* (8th ed.) (pp. 2119-2133). Philadelphia: Saunders Elsevier.

Yohannes, A., Yalfani, A., Doherty, P., & Bundy, C. (2007). Predictors of drop-out from an out-patient cardiac rehabilitation programme. *Clinical Rehabilitation*, *21* (3), 222-229.

Yusuf, S., Hawken, S., Ounpuu, S., Dans, T., Avezum, A., Lanas, F. ... INTERHEART Study Investigators (2004). Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *The Lancet*, *364*(9438), 937-952.

Zeidner, M. Boekaerts, M., & Pintrich, P. R. (2000). Self-regulation dimensions and challenges for future research. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds) *Handbook of self-regulation*, San Diego: Academic Press.

Zeidner, M., & Saklofske, D. (1996). Adaptive and maladaptive coping. In M. Zeidner (Ed.) *Handbook of coping* (pp.505-531). Toronto: John Wiley and Sons.

Zou, X., Tam, K-P., Morris, M. W., Lee, S-l., Lau, I., Chiu, C-y. (2009). Culture as common sense: Perceived consensus versus personal beliefs as mechanisms of cultural influence. *Journal of Personality and Social Psychology*, *97* (4), 579-597.

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

APPENDIX E

APPENDIX F

APPENDIX G